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Native Timber Harvests in Southeast Alaska

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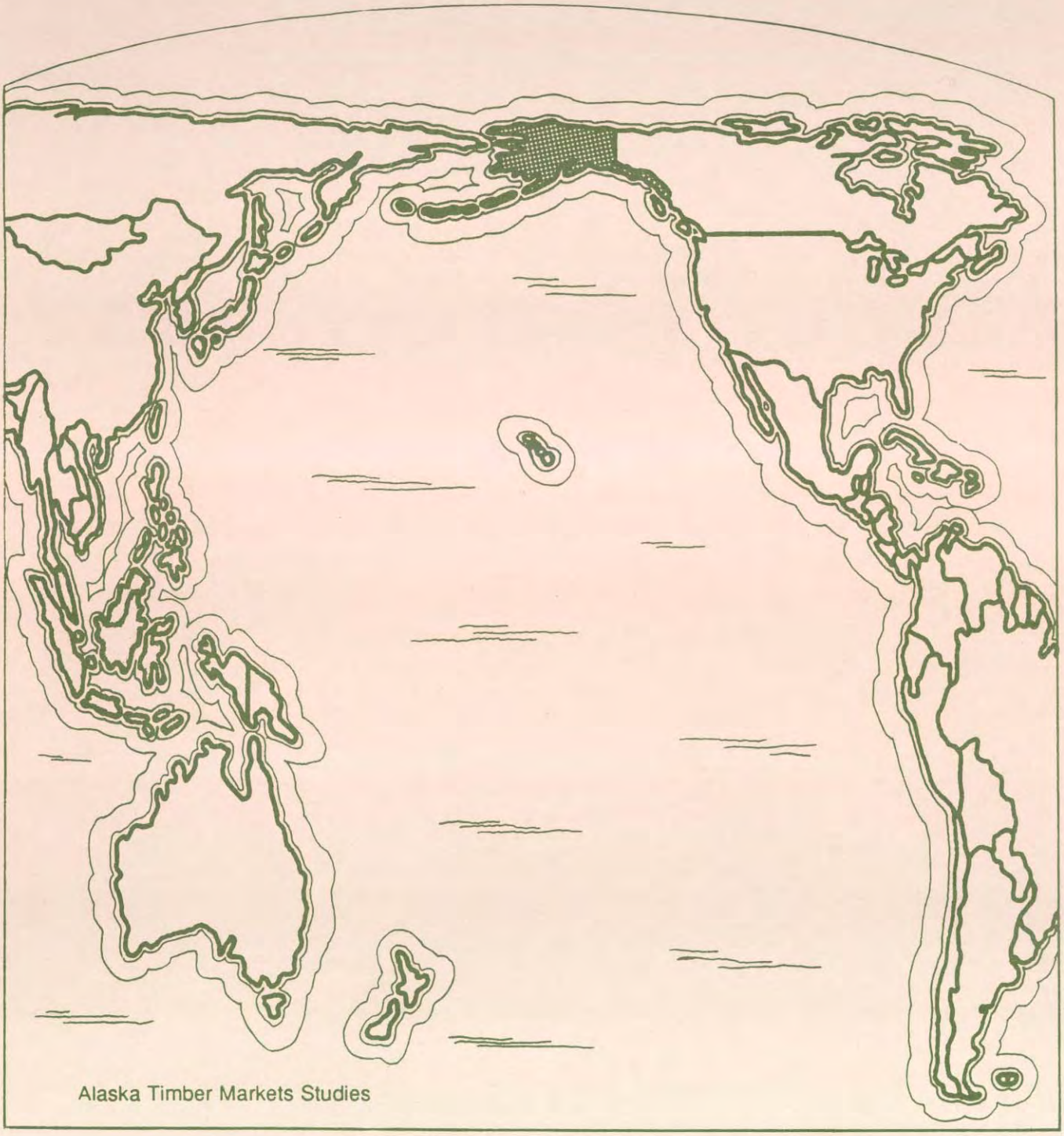

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Abstract

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The Alaska Native Claims Settlement Act established 13 Native corporations in southeast Alaska. There are 12 "village" corporations and 1 "regional" corporation (Sealaska Corporation). The Native corporations were entitled to select about 540,000 acres of land out of the Tongass National Forest; about 95 percent have been conveyed. This study reviews Native corporation timber resources, harvests to date, and projected future harvest levels.

Publicly available data on the volume of timber conveyed to Native corporations are subject to a wide margin of error. Estimates based on USDA Forest Service data suggest that economic volume at conveyance was between 4.0 and 7.8 billion board feet. About 56 percent of this timber volume was on village corporation lands, with the remainder on Sealaska lands.

Native corporation timber harvests began in 1979 and grew rapidly to about 400 million board feet in 1987 and 1988, despite depressed timber markets from 1981 to 1986. Timber harvests in 1989 were about 600 million board feet. Since 1983, more than half the timber harvests in southeast Alaska have occurred on Native lands. More than 3 billion board feet were harvested by 1989. Most of the timber is exported as round logs, primarily to Japan.

Most of the village corporations will have harvested all their merchantable timber by 1991. If current market conditions continue, Native harvests will decline sharply between 1989 and 1992 as most village corporation harvests end. About 10 to 15 years from now, harvests will again decline after Sealaska Corporation completes logging on most of its lands.

Keywords: Alaska (southeast), Native corporations, timber harvests, timber inventory.

Contents

Introduction

The 1971 Alaska Native Claims Settlement Act (ANCSA) established 13 Native corporations in southeast Alaska that were entitled to select about 550,000 acres of land from the Tongass National Forest. About 90 percent of these lands have been conveyed to Native corporations, with most land conveyances occurring in 1979 and 1980. These lands had, in 1979, an estimated standing timber volume of about 11 billion board feet, or about 10 percent of the timber volume available for harvest in southeast Alaska.[1]

Most Native corporations began timber harvesting operations shortly after receiving title to their lands. Native timber harvests grew rapidly to more than 613 million board feet in FY 1989 (table 1, fig. 1). Since 1983, more than half the timber harvests in southeast Alaska have occurred on Native lands. Many of the corporations have now harvested most of their merchantable timber, and Native corporation harvests are expected to decline significantly from the levels of recent years.

Native harvests are an important consideration in the projections of future demand for Tongass National Forest timber. According to the USDA Forest Service, the growth in Native timber harvests contributed to a decline in Tongass National Forest timber harvests from 1982 to 1985; the Forest Service expects demand for Tongass timber to increase, however, as Native harvests decline in the future (USDA Forest Service 1988b: 5,11).

This study reviews Native corporation timber resources, harvests to date, and projected future harvest levels. It is based entirely on publicly available information.[2] The major data sources included Forest Service forest inventory data collected before conveyance of Native lands from the Tongass National Forest, Forest Service estimates of annual timber harvests from Native lands, and Native Corporation annual reports.[3] In addition, I spoke with numerous Federal, State, and private industry officials knowledgeable about the southeast Alaska forest industry.

Available data on Native corporation inventory and harvests are limited. No data are publicly available on current timber inventories on Native lands. The only systematic inventories of Native timber for the ownership as a whole occurred either before or shortly after conveyance. These original inventory estimates are subject to wide margins of error.

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[1] Van Hees (1988: 6). Total estimated net volume for southeast Alaska in the mid-1970s was 149 billion board feet Of this, 38 billion board feet was on lands are currently reserved and not available for timber harvest (for example, wilderness). Excluding these lands, net timber volume conveyed to Native corporations was about 10 percent of the nonreserved timber volume in southeast Alaska.

[2] Sealaska Corporation, the largest Native timber holder, declined to provide information on timber inventory or harvests for this study. This precluded a more straightforward analysis based on Native corporation records.

[3] Under Alaska law, corporations with more than 500 shareholders must file copies of annual reports with the Alaska Department of Commerce, Division of Banking and Securities These documents are available for review by the public. I reviewed all annual reports on file with the division; however, annual reports were not available for some of the smaller village corporations

Table 1—Timber harvests in southeast Alaska by ownership, fiscal years 1980-89

Fiscal year	Landowner: Native corporations[3]	Forest Service	State of Alaska	BIA	Total	as percentage of total
	---------*Millions of board feet* ---------					*Percent*
1980[b]	145	480	33	13	671	22
1981	89	387	39	5	520	17
1982	157	370	26	3	556	28
1983	304	250	21	3	578	53
1984	290	261	15	1	567	51
1985	286	232	4	0	522	55
1986	355	291	11	0	656	54
1987	411	336	16	0	764	54
1988	408	396	14	0	818	50
1989	613	445	14	4	1074	57
Total	3057	3448	192	28	6725	45

[a] Native harvests for fiscal years 1982-86 may include about 20-40 MMBF harvested in south-central Alaska.

[b] Source. USDA Forest Service 1989 : 2

Source: USDA Forest Service 1990 : 10

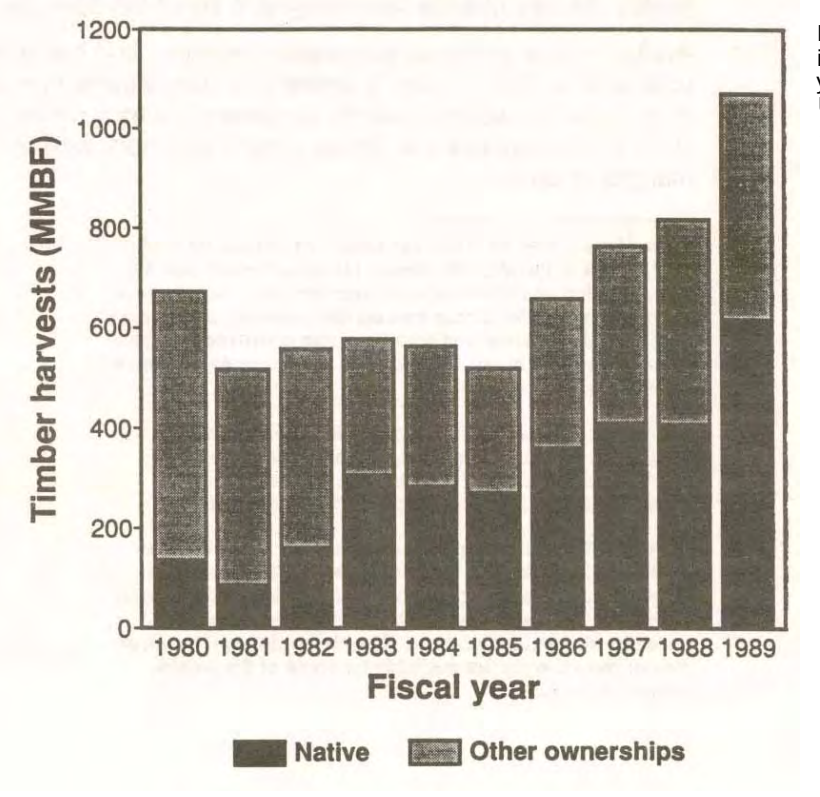

Figure 1—Timber harvests in southeast Alaska, fiscal years 1980-89. (Sources. USDA Forest Service 1989. 2;1990:10.)

Estimates of timber harvests from Native lands also are subject to wide margins of error, and additionally, historical timber sale volumes may significantly understate the volume of timber removed from economic inventory. Because of low timber prices during much of the 1980s, a large but unknown volume of lower quality timber was cut but not used. Some marginal timber that might have been harvested under more favorable market conditions was left standing but was effectively removed from economic inventory because of high costs in returning to previously harvested areas for relatively low volumes of remaining timber.

I used two different approaches to examine remaining inventory and potential future harvests from Native lands. The first approach, which represents the bulk of the study, was to determine reasonable ranges for inventory conveyances and past harvests and was based on a review of available sources of data and their limitations. These ranges are then used to estimate a range for remaining timber inventory on Native lands. The second, more direct approach, was to summarize available information about remaining inventory and harvest plans for each of the 13 corporations. Future harvests projected with this second approach are consistent with the lower end of the range estimated by the first approach.

Southeast Alaska Native Corporations

The Alaska Native Claims Settlement Act

Background—In 1971, the U.S. Government settled the aboriginal land claims of Indians, Eskimos, and Aleuts in Alaska with passage of the Alaska Native Claims Settlement Act (ANCSA). The Government had long acknowledged that the Native peoples in Alaska had some rights to land in Alaska because they had lived on and used that land for thousands of years and had never signed treaties relinquishing their rights. But for many years there was no pressing need to define Native land rights: Alaska was a huge place with few people, the Federal Government owned virtually all the land, and Alaska Natives had much the same access to land that they had always had.

In 1959, Alaska became a State, and the new State Government received rights to select more than 100 million acres. Native groups decided that the time had come to act on their claims. Within a few years, essentially all of Alaska was under Native claim, and in 1967 the Secretary of the Interior halted land transfers to the State Government until the claims were settled. Soon after, in 1968, oil companies exploring on the North Slope discovered what proved to be the largest known oil field in North America: the 10-billion barrel Prudhoe Bay field. Development of that field and construction of a pipeline across Alaska were prevented by the unresolved Native land claims.

Settlement terms—The freeze on State land transfers and the huge untapped oil field put Alaska Natives in a strong bargaining position. On December 18,1971, ANCSA became law and awarded Alaska Natives by far the biggest settlement ever of aboriginal claims: $1 billion and 40 million acres. The act also gave Native villages on existing land reserves the option of taking ownership of those lands. Several villages did so. thereby bringing total land awarded Alaska Natives under the act to about 44 million acres.

The Alaska Native Claims Settlement Act is a complicated law that has been amended many times since 1971. Congressional and court battles over provisions of the act are still going on. Below, I briefly describe the general terms of the act and the provisions most relevant to this study.

Regional and village corporations—The claims settlement called for the establishment of Native regional and village corporations to manage the land and money awards. These corporations—particularly the regional corporations—were to be profit-making and thereby parlay the settlement land and money into a healthy economic future for Alaska Natives. Thirteen regional corporations—12 in Alaska and 1 for Natives living outside the State—and more than 200 village corporations were formed under the act. All Natives alive on the day the act was signed into law were to share in the settlement. Under terms of the act, eligible Natives were defined as those able to prove that they were at least one-quarter Eskimo, Indian, or Aleut. Each eligible Native was to receive his share of the settlement by enrolling in a regional and a village corporation and becoming a stockholder. About 78,000 persons ultimately enrolled under the act.

Cash award—The $1 billion cash award came partly from Federal money and partly from State Government petroleum revenues. It was paid in installments, with the final installment paid in 1981. The payments were split roughly in half between regional and village corporations, with the payments to individual corporations based mostly on population.

Land award—Transferring 40 million acres from Federal to Native ownership has been a slow, complex, contentious process. At the end of 1987, Native corporations had received title to about 88 percent of their lands.

When the act was passed, the U.S. Government identified specific Federal lands for the Native corporations to choose from. These lands, known as "withdrawal lands" because they were withdrawn from other uses, were mainly near Native villages; in instances where there was not enough available land near a village, the Government set aside "deficiency lands" elsewhere for Native selection. The corporations selected land from the withdrawal and deficiency lands for several reasons, but mainly for their subsistence and historic values and for their potential resource wealth.

The village corporations received surface rights to about 22 million acres. The regional corporations received subsurface rights to the village lands. Each village corporation received lands according to its population, with the smallest villages (those with populations of less than 100) receiving about 69,000 acres each and the largest (those with populations of more than 600) about 161.000 acres each. Exceptions to this general rule were the corporations in southeast Alaska, which received rights to 23,000 acres each, regardless of population.

Most of the remaining 16 million acres were divided among the regional corporations under a complicated formula based mainly on land area within the region: the regions largest in acreage got the most land, even if their populations were small. Six regional corporations received land under this formula; the Doyon region in the interior and the Arctic Slope region got the largest shares. Rights to regional corporation lands include both surface and subsurface rights.

Taxation of ANCSA lands—Under section 21 (d) of ANCSA, timber and land received by Native corporations under ANCSA that is undeveloped is exempt from State and local property taxes for 20 years after the date of enactment of ANCSA.

7(1) provision— Section 7(i) of ANCSA requires each regional corporation to distribute 70 percent of its net revenues from timber and mineral development among the 12 Alaska-based regional corporations (including the distributing corporation). This provision was included in the law on the grounds that some regions would be richer in resources than others would. Application of the revenue-sharing provision has been the subject of many disputes and several court battles. In 1982, a Settlement Agreement was adopted by the regional corporations that clarified procedures for 7(i) distributions. Village corporations are not required to share their timber revenues with other corporations.

22(k) provisions ---- Section 22(k) of ANCSA requires that for 5 years, any sale of timber from lands selected under the act be "subject to the same restrictions relating to the export of timber from the United States as are applicable to national forest lands in Alaska." This section also required that for 12 years, these lands be "managed under the principle of sustained yield and under management practices for protection and enhancement of environmental quality no less stringent than such management practices on adjacent national forest lands.. . ."

In practice, the 22(k) provisions of ANCSA never were enforced. Responsibility for interpreting or enforcing these provisions was not clearly assigned by ANCSA. The Native corporations did not begin to receive conveyance to substantial areas of forest land until 1979, 8 years after the passage of ANCSA, and large-scale timber harvests did not begin until several years later. The corporations and most agencies with potential responsibility for enforcement interpreted the periods referred to in the 22(k) provisions as dating from the passage of ANCSA.

1991 provisions—The act originally said that stock in Native corporations could not be sold or seized for most kinds of debt until 20 years after the act was passed; after 1991, Native corporate stock was to become freely transferable. As 1991 drew closer, Native leaders worried that when it became legal for shareholders to sell or lose their stock the corporations could go under the control of non-Natives, and a result would be loss of control by Natives of lands they had been awarded in settlement of their aboriginal claims.

Native groups asked Congress to extend the ban on stock sales beyond 1991. At the end of 1987. Congress passed legislation that extends the ban on transfer of stock past 1991 but allows stockholders in each corporation the option of deciding whether to make their stock freely transferable. Then-President Reagan signed this legislation in February, 1988 (Alaska Native Claims Settlement Act Amendments of 1987).

The 1991 amendments also made several other significant changes to ANCSA. The 20-year exemption of undeveloped Native lands from State and local taxation was made permanent rather than ending in 1991. If timber harvests occur, only the approximate area where timber is being harvested is subject to taxation. After commercial harvests end, timberland is no longer considered "developed" and is protected from taxation (Alaska Federation of Natives 1988).

Southeast Alaska Native Corporations

Under ANCSA, Congress created one regional corporation for southeast Alaska, Sealaska Corporation. Alaska Natives enrolled in Sealaska represent about 21 percent of total Alaska Native enrollment (Sealaska Corporation 1987: 27). The act also created 10 village corporations and 2 urban corporations (for Juneau and Sitka) in southeast Alaska. For simplicity, in this report, I have included the two urban corporations under the term "village corporations."

Table 2 summarizes the names of the villages and corporations, the number of shareholders, and the area of their land entitlement. The total ANCSA land entitlement of the Native corporations is about 544,000 acres, of which Sealaska Corporation is to receive about half.

Village corporation land selections—Figure 2 shows the areas of major land selections by southeast Alaska Native corporations. Almost all the lands selected by these corporations was in the Tongass National Forest. Land selections for seven of the village corporations are near the villages, as provided for under ANCSA;[4] however, land selections for five of the village corporations (Goldbelt, Shee-Atika, Kootznoowoo, Klukwan, and Cape Fox) are a considerable distance from the communities. This is due in part to restrictions within ANCSA on where selections could take place and the provision for alternative selection areas off of Admiralty Island to resolve environmental disputes. In addition, a number of land trades have taken place between the Forest Service and Native village corporations after the original conveyances.

As shown in table 3, the village corporations have been conveyed almost all their ANCSA land entitlements. Most of the conveyances took place between 1979 and 1981.

As a result of legislation passed after ANCSA, several village corporations are entitled to exchange ANCSA lands for other lands within the Tongass National Forest. The Admiralty Island National Monument Land Management Act of 1990 provided for exchanges of ANCSA lands held by Kootznoowoo for other lands on a value for value basis. The Haida Land Exchange Act of 1986 provided for the purchase of 5,400 acres of Haida lands by the Federal Government for $11 million; an exchange of approximately 4,200 acres of Haida lands for other Federal lands; and further exchanges, beginning in 1995, of remaining Haida ANCSA lands (including lands on which timber had been harvested) for other Federal lands on an acre-for-acre basis. The Tongass Timber Reform Act of 1990 designated 5,600 acres of high-volume Federal timber lands that may be selected in exchange for Haida lands before November 1991. An additional provision of the Tongass Timber Reform Act of 1990 requires a study of potential exchanges of Tongass National Forest lands for previously harvested Native corporation lands.

Other legislation that would have provided additional timber lands to southeast Alaska village corporations has been considered by Congress; for example, under a provision proposed for the Tongass Timber Reform Act of 1990 but not included in the final legislation, Goldbelt would have received additional timber lands near Hobart Bay in return for recreational lands near Juneau. Exchanges of this type, under which Native corporations would receive additional timber lands in return for land with recreational, wilderness, or other values but not necessarily acre for acre. are possible in the future and could further increase timber supply from Native lands.

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[4] Under Section 16(b) of ANCSA, each village corporation was to select "an area equal to 23,040 acres, which must include the township or townships in which all or part of the Native village is located, plus, to the extent necessary, withdrawn lands from the townships that are contiguous to or corner on such township All selections shall be contiguous and in reasonably compact tracts, except as separated by bodies of water, and shall conform as nearly as practicable to the United States Lands Survey System "

Table 2—Southeast Alaska Native corporations

Type of corporation	Village or city	Corporation name	Number of shareholders[a]	Land entitlement[b]
				Acres
Village	Angoon	Kootznoowoo, Inc.	620	23,040
Village	Craig	Shaan-Seet, Inc.	317	23,040
Village	Hoonah	Huna Totem Corp.	870	23.040
Village	Hydaburg	Haida Corp.	563	23.040
Urban	Juneau	Goldbelt, Inc.	2,722	23,040
Village	Kake	Kake Tribal Corp.	558	23,040
Village	Kasaan	Kavilco. Inc.	119	23,040
Village	Klawock	Klawock Heenya Corp.	518	23,040
Village	Klukwan	Klukwan, Inc.	250	23,040
Village	Saxman	Cape Fox Corp.	230	23,040
Urban	Sitka	Shee-Atika, Inc.	1,804	23,040
Village	Yakutat	Yak-Tat-Kwaan, Inc.	392	23,040
Total, village and urban corporations			8,963	276,480
Regional		Sealaska Corporation	15,388[c]	267,250 approx.
Total			15.388	543,730 approx.

[a] Source (except for Sealaska Corporation): Hoffman 1987.

[b] Source: U.S. Department of Agriculture. Forest Service. 1990. Region 10 Native land selections statistics **as** of July 1,1990.16 p. Unpublished table. On file with: Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, Alaska 99508. Village corporation entitlements include only those described in Sections 14 and 16 of ANCSA; additional entitlements provided for In subsequent legislation are not included. Sealaska entitlement is approximate: entitlement will vary depending upon selection of 14(h)(1), 14(h)(2), 14(h)(3), and (14(h)(5) sites.

[c] Source: Arnold 1978: xvi. Sealaska enrollments as of June 30. 1978. Village corporation shareholders are also Sealaska shareholders.

Sealaska Corporation land selections–Under ANCSA, Sealaska Corporation was entitled to select lands from eight withdrawal areas adjacent to Native villages (fig. 2). As of July 1,1990, 238,240 acres had been conveyed to Sealaska. Most of these lands were conveyed in 1979 and 1980.

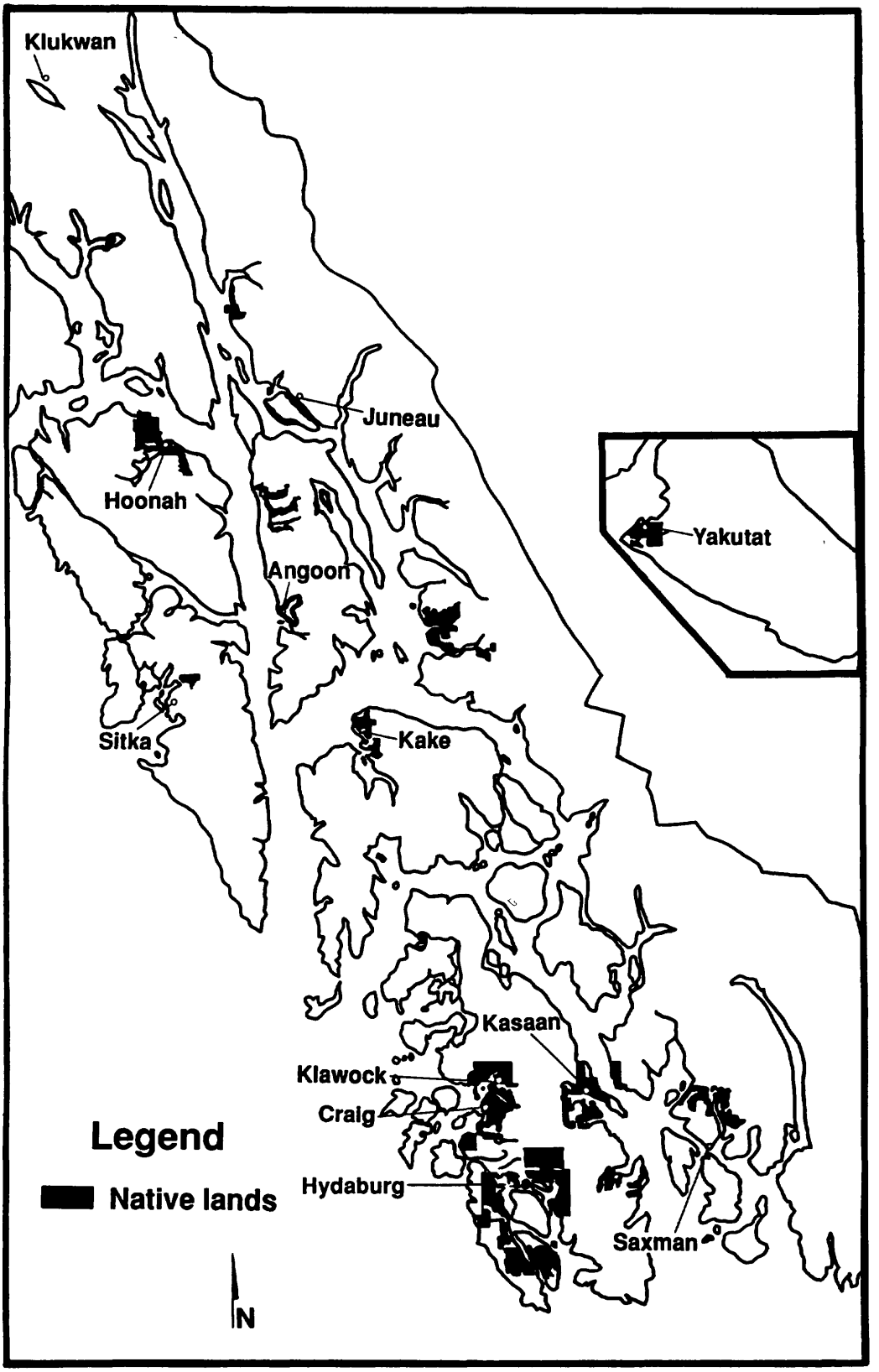

Figure 2—Southeast Alaska Native corporation lands and villages.

Table 3—Land conveyances to southeast Alaska Native corporations as of July 1,1990

Corporation	ANCSA land entitlement[3]	Area conveyed					
		Before 1979	1979	1980	1981	1983-90	Total
Cape Fox Corporation	23.040	3.763	6.954		7.065	2,033	19.815
Goldbelt, Inc.	23,040		27,767		2,969	0	30,736
Haida Corporation	23,040		20,770	40	40		20.850
Huna Totem Corporation	23,040		20,587	61	960	(2.224)	19,384
Kake Tribal Corporation	23,040		21,711			794	22,505
Kavilco, Inc.	23,040		23.040			27	23,067
Klawock Heenya Corporation	23,040			19,792		2.539	22,331
Klukwan. Inc.	23.040			21,349		2,381	23,730
Kootznoowoo, Inc.	23,040			7,710		18.040	25,750
Shaan-Seet, Inc.	23.040		20,857			1.710	22,567
Shee-Atika, Inc.	23,040		3,190		23,073	33	26,296
Yak-Tat-Kwaan, Inc.	23,040	1	20,103			1,737	21,841
Total	276.480	3.764	164,979	48,952	34,066	27.111	278.872
Sealaska Corporation	267.250 approx.		159,481	35,745	2,600	40,414	238,240
Total	543,730 approx.	3,764	324,460	84.697	36,666	67,525	517,112
				Percent			
Percentage of ANCSA entitlement conveyed:							
Village corporations		1	60	18	12	10	101
Sealaska Corporation		0	60	13	1	15	89

[a] Village corporation entitlements include only those described in Sections 14 and 16 of ANCSA, additional entitlements provided for in subsequent legislation are not included. Sealaska entitlement is approximate: entitlement will vary depending upon selection of 14(h)(1), 14(h)(2), 14(h)(3), and (14(h)(5) sites.

Source U.S. Department of Agriculture, Forest Service 1990. Region 10 Native land selections statistics as of July 1, 1990. 16 p. Unpublished table. On file with. Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508

Estimates of Sealaska's total land entitlement range from as low as 267,000 acres (a Forest Service estimate[5]) to as high as 340,000 acres (a Sealaska Corporation estimate [Sealaska Corporation 1987: 27]). This discrepancy results in part from different expectations for eventual land entitlements under ANCSA, Section 14(h). Under Section 14(h), 2 million acres were set aside for conveyance of lands for cemetery sites, historical places, and Native allotments. Lands not conveyed for these purposes are to be allocated to the regional corporations on the basis of population. Depending on the size of Sealaska's Section 14(h) entitlement and other factors, Sealaska is entitled to receive between 29,000 and 102,000 acres in addition to lands received before July 1, 1990.

Annette Island Indian Reservation—The Annette Island Indian Reservation in southeast Alaska was established before and independently of ANCSA. The Bureau of Indian Affairs provides management for about 22,000 acres of timberland on the reservation with a total volume of about 300 million board feet (MMBF). Timber is harvested on a periodic, uneven basis (Mehrkens 1983: 21). Historically, harvests have been relatively small compared with those on Native corporation lands or public lands. The Annette Island Reservation lands are not included in the discussion of Native timber harvests in this report.

Timber Inventories on Native Lands

In this section, I will examine the timber volume conveyed to Native corporations in southeast Alaska. Available estimates of the volume of timber conveyed to Native corporations provide at best a general indication of timber volume originally available to Native corporations for harvest, because they are based on limited data and do not account for the widely fluctuating timber markets that have prevailed since the conveyance of Native lands.

Forest Service Inventory Estimates

Two different Forest Service inventory analyses of southeast Alaska timber resources may be used to estimate the timber volume conveyed to Native corporations. Both analyses are based on data collected for Forest Service lands during the 1970s, before the conveyance of some of these lands to Native corporations.

Limitations of Forest Service inventory estimates—A significant problem with available inventory data is that the ground and photo plot data developed for the Forest Service inventory analyses were not designed to provide accurate estimates of inventory for the relatively small areas destined to become Native corporation lands, but rather were for broader areas within the Tongass National Forest. The limited number of plots that happened to fall within what were to become Native lands do not provide a basis for inventory estimates that are anywhere near as statistically reliable as those for larger areas in the Tongass National Forest. The estimates thus are subject to a wide margin of error.

Timber inventory or volume can be defined in several ways. Confusing different concepts of timber volume can lead to significant misinterpretations of available inventory data for Native lands in southeast Alaska.

[5] USDA Forest Service. 1990 Region 10 Native land selections statistics as of July 1, 1990. 16 p Unpublished table. On file with: Institute of Soda) and Economic Research. University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508. This estimate is approximate' the entitlement will vary depending upon land selections under sections 14(h)(1), 14(h)(2), 14(h)(3), and (14(h)(5) of ANCSA.

The first potential source of confusion is that Forest Service Scribner rule inventory volume tends to overstate scaled harvest volume in southeast Alaska by more than 20 percent. Thus an adjustment factor must be applied to Forest Service inventory estimates to estimate potential harvests.

Second, the most commonly published forest inventory data report net timber volume.[6] This is a physical measure of timber theoretically available for harvest. In southeast Alaska, large areas of timber cannot be harvested profitably, because the areas are too steep, too remote, too environmentally sensitive, or otherwise inaccessible. Net timber volume thus may greatly overstate the timber volume that could realistically be harvested from a given ownership.

To project potential harvests, estimates are needed for economic timber inventory, or the volume of timber that can be harvested profitably. For a given stand of timber, economic inventory fluctuates depending on market conditions and harvest costs. The higher the costs of harvesting timber, the greater the fluctuation in economic inventory in response to changes in timber prices. Because harvest costs on Native lands in southeast Alaska are high, economic inventory on Native lands has been highly sensitive to widely changing market conditions during the 1980s.

The sensitivity of economic inventory to market conditions is illustrated by a statement from a Sealaska official. Although Sealaska Corporation cut several hundred million board feet of timber from its lands between 1985 and 1988, Sealaska's senior vice president for resources stated in 1988, "from an economic perspective, we actually have a larger forest now than we did in 1985. The marginal stands of three years ago are now marketable. If the market turns down, then the amount of timber we can economically harvest will shrink" (Sealaska Shareholder 1988).

Economic inventory can be defined or measured only in terms of a given set of market and cost conditions. I have attempted in this report to estimate economic inventory for the market and cost conditions at the time of conveyance of Native lands. The economic inventory remaining in subsequent years depends on timber harvests and other removals from original economic inventory and on market and cost conditions.

It is difficult to measure economic timber inventory for large areas in southeast Alaska, because local conditions such as slope and access greatly affect economic operability of timber stands. These conditions are difficult to quantify through aerial photo inventory techniques and require more expensive on-the-ground surveys.

FIA Inventory estimates—Table 4 presents inventory estimates developed by the Pacific Northwest Research Station, Alaska Forest Inventory and Analysis unit (FIA). These are estimates of timberland area and timber volumes as of the mid-1970s on lands owned in 1985 by private corporations in southeast Alaska (almost all these

[6] Net volume is defined as "the gross volume of a tree less deductions for rot. sweep, or other defect affecting product use- (van Hees 1988:10, 11)

lands are owned by Native corporations). The estimates of timber areas and volumes were derived from ground plot inventory data collected between 1970 and 1975.[7] Current ownership was established by beating the plots on land status maps for March 1985 (van Hees 1988: 2).

According to the FIA estimates, the total area of timberland in the mid-1970s on lands owned in 1985 by Native corporations was 409,000 acres. ("Timberland" is defined as "forest land producing or capable of producing more than 20 cubic feet per acre per year of wood under management" [van Hees 1988:11].) This compares with about 464,000 acres of land conveyed to Native corporations as of 1985. Most Native land seems to meet the Forest Service definition of timberland.

According to the FIA estimates, net timber volume on Native lands was 10.9 billion board feet (Scribner rule). Most of this volume was in old-growth western hemlock *(Tsuga heterophylla* (Raf.) Sarg.) or hemlock-spruce *(Tsuga-Picea)* stands.[8]

These estimates are similar to earlier Forest Service volume estimates for Native lands. A 1978 Forest Service-sponsored study reported a timber inventory of 11,250 MMBF for Native corporation lands, based on data provided by Sealaska.[9]

The figure of 10.9 billion board feet must be viewed as a theoretical maximum for old-growth timber harvests from Native lands. In practice, economic inventory on these lands would be considerably lower for several reasons. First, there may be a significant difference between Scribner inventory volume and scaled harvest volume. According to a Forest Service study (Hutchinson and LaBau 1975:12),

> Scaled log volume is only about 73.6 percent of inventory volume. The difference between inventory and scaled volume is caused by (1) losses from breakage and other residues during logging, (2) use of the 16-foot-log volume table for inventory when average scaled length is about 32 feet, and (3) scaling diameters rounded to the last full inch, whereas inventory volumes are based on rounding diameters to the nearest inch. The allowance for these factors reduces the inventory volume estimate by about 26.4 percent. As utilization practices improve, more of the inventory volume will end up in products.

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[7] Ground plot inventory data for the Haines unit was collected before 1970 No large private corporation ownerships occur in this area. Personal communication, January 11, 1989, George Rogers, Inventory Specialist, USDA Forest Service, Alaska Region, P.O Box 21628, Juneau, AK 99802-1628.

[8] In general, average timber inventory per acre tended to be higher on lands conveyed to Native corporations than on remaining Forest Service lands. Most of the Native corporation land selections were made for their access to high-valued timber. Thus, Native timber tends to be of higher grade than remaining National Forest timber or in more favorable locations to harvest (Mehrkens 1984: 25)

[9] Glass, Ronald J. 1978 An assessment of the demand-supply situation for southeast Alaska timber. 54 p. Working report prepared for USDA Forest Service, Alaska Region. On file with. Institute of Soda! and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508.

Table 4—Estimated timber Inventory as of mid-1970s on lands owned In 1985 by private corporations In southeast Alaska[a]

Species and volume class	Area of timber-land[b]	Net timber volume[b]	Net timber volume, International 1/4-inch rule[b]	Net timber volume, Scribner rule[c]	Net timber volume per acre, Scribner rule
	Acres	*Million cubic feet*	*- - Million board feet - -*		*Thousand board feet*
Western hemlock and hemlock-spruce:					
Seedlings and saplings	15	22	14		
Poletimber					
Young growth	14	66	298		
Old growth	269	2.044	10,086		
Subtotal	297	2,132	10,397	9.550	**32**
Western redcedar and Alaska-cedar:					
Seedlings and saplings					
Poletimber					
Young growth					
Old growth	72	242	844		
Subtotal	72	242	844	742	10
Sitka spruce:					
Seedlings and saplings	10	8	34		
Poletimber					
Young growth					
Old growth	18	112	594		
Subtotal	29	119	627	586	20
All other:					
Seedlings and saplings	4				
Poletimber					
Young growth					
Old growth	7	19	68		
Subtotal	11	19	68	63	6
Total:					
Seedlings and saplings	29	30	47		
Poletimber					
Young growth	14	66	298		
Old growth	366	2,416	11,591		
Total	409	2,512	11,936	10,941	27

[a] Data are a summary of Forest Service inventory statistics for the private corporation ownership category for southeast Alaska. Area estimates are based on land status of ground plots as of March 1985 Volume estimates reflect condtions at the year of inventory (1970-75).

[b] Source Data provided by Willem W S van Hees at the request of the author Data available from Willem W S van Hees, research forester, USDA Forest Service, Pacific Northwest Research Station, Forestry Sciences Laboratory, Anchorage, AK 99501

[c] Source van Hees 1988: 7.

To account for the difference between inventory and scaled harvest volume, the Forest Service has used, since the early 1960s, an adjustment or fall-down factor of 0.77 to estimate scaled volume from Scribner rule inventory estimates for the Tongass National Forest.[10] Applying this adjustment factor to the FIA estimate of 10,941 MMBF results in a revised estimate of 8,425 MMBF for the scaled harvest volume that could be cut from Native lands.

Second, the FIA inventory estimates do not distinguish between economic and non-economic timber stands. The only timber volume not included is that on lands not capable of producing growth of 20 cubic feet per acre per year. As will be discussed below, Forest Service inventory data developed during the preparation of the first Tongass Land Management Plan (TLMP1) suggest that the ratio of economic timber volume to total timber volume may be only about 70 percent. Applying this ratio to the figure of 8,425 MMBF results in an estimate of economic timber volume of 5,897 MMBF. Because of the few sample points, this estimate is subject to a wide margin of error. A Forest Service analyst estimated the sample error for the total FIA cubic volume at 16.5 percent.[11] Applying this same sample error to my estimate of economic timber volume suggests about a 66-percent probability that economic timber volume conveyed to southeast Alaska Native Corporations by 1985 was between 4,924 and 6,870 MMBF and a 95-percent probability that this volume was between 3,950 MMBF and 7,843 MMBF.[12]

TLMP1 Inventory estimates—An alternative data base for estimating timber volume conveyed to Native corporations was developed during the preparation of TLMP1. This data base was constructed during the late 1970s by coding volume per acre and operability estimates from interpretations of aerial photograph points.

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[10] The figure of 73.6 percent cited by Hutchinson and LaBau (1975- 12) has never been used by the Forest Service The Forest Service is presently revising inventory estimating procedures to use a volume equation that assumes a 32-foot log length. Under this new procedure, an adjustment factor will no longer be required to estimate harvest volume from inventory estimates. Personal communications, December 2, 1988, Bill Wilson, Timber Planner, USDA Forest Service, Alaska Region, P.O. Box 21628, Juneau, AK 99802-1628; and January 11, 1989, George Rogers, Inventory Specialist, USDA Forest Service, Alaska Region, P 0 Box 21628, Juneau, AK 99802-1628.

[11] Personal communication, January 11, 1989, George Rogers, Inventory Specialist, USDA Forest Service, Alaska Region, P.O Box 21628, Juneau, AK 99802-1628

[12] In theory, a sample error of 16.5 percent means that there is about a 66-percent probability that the true volume is within 165 percent of the estimated volume, and about a 95-percent probability that the true volume is within 2 x 16.5 or 33 percent of the estimated volume Applying this same sample error to the total board foot volume would imply a sample error of 1,805 MMBF. Reducing this figure by the adjustment factor of 0.77 and the economic operability ratio of 0.70 results in a sample error of 973 for this estimate of economically operable timber volume.

Table 5 shows Forest Service estimates, based on the TLMP1 data base, of the total area of forest land conveyed to Native corporations by volume class and operability.[13] The estimated total timberland area on Native lands was 409,000 *acres.*[14]

Because the TLMP1 data are coded by volume class and operability, these data can be used to derive a crude estimate of economic timberland area on Native lands. A liberal assumption is that all stands of "normal" operability in volume classes greater than 20 thousand board feet (MBF) per acre are "economically operable."[15] By this definition, only 218,000 acres, or a little more than half of the total timberland area conveyed to Native corporations, was economically operable.

The TLMP1 estimates of forest area on Native lands can be used to estimate total and economic timber volume on Native lands by multiplying the area in each volume and operability class by assumed average volumes per acre. Assumptions of average scaled harvest volume per acre for TLMP1 data were developed by the Forest Service from a previous inventory in which photo interpretations were compared with ground measurements of plots. These assumptions allow for losses from breakage, losses in delivery, and hidden defects.

Table 6 shows estimated timber volumes based on these volume-per-acre assumptions. The estimated total timber volume on Native lands was 9.5 billion board feet. Sealaska lands accounted for about 44 percent of the total forest area and volume conveyed to Native corporations.

Under my liberal definition, economic timber volume was 6.7 billion board feet. Economic timber volume was only about 70 percent of total timber volume. Put differently, about 30 percent of total Native timber volume was either in nonstandard or inoperable stands or in stands with volumes less than 20 MBF per acre.

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[13] Slightly differing figures from the TLMP1 data base for Native ownership by volume class were published by the USDA Forest Service (1988a' 67) in response to a question asked by the Southeast Alaska Conservation Council.

[14] This is identical to the area estimate in table 4 Apparently the forest area estimates are based on the same coding of the ownership status of ground plots

[r5] The Forest Service defines operable timberland as "all timberland considered silviculturally and economically operable This includes areas on stable soils, on slopes that are not too steep to log without causing site damage and stands valuable enough to pay logging costs using methods and costs in effect at the time of the inventory." Inoperable timberland "includes areas of timberland that are presently inoperable because of marginal volume (usually less than 20,000 board feet per acre) or rough, rocky, cliffy, or otherwise broken terrain. This also includes pockets of high-volume timberland that are isolated or more than one-fourth mile from operable timberland areas" (van Hees 1985' 6, 8). The liberal assumption that all stands with volumes exceeding 20 MBF per acre are economic is based on conversations with industry and Forest Service representatives. Some observers suggested that a higher volume per acre would be a more realistic cutoff.

Table 5—Forest Service estimates of area of forest land conveyed to southeast Alaska Native corporations, by volume class and operability[a]

Owner	Operability	Volume class (MBF/acre)[0] 0-8	8-20	20-30	30-50	50+	Total area	economically operable area
		Acres						
Village corporations	Normal	12,220	56,372	68,086	36,267	17,480	190.425	121,833
	Nonstandard	505	10,602	12,223	5,486	628	29,444	
	Inoperable	166	6,622	1,285	62	0	8,135	
	Total	12,891	73,596	81,594	41,815	18,108	228,004	121.833
Sealaska	Normal	8.441	40.478	53,726	31,286	10,897	144,828	95.909
	Nonstandard	166	10,252	12,243	3,495	82	26,238	
	Inoperable	174	5,817	2,050	1,317	87	9,445	
	Total	8,781	56,547	68,019	36,098	11,066	180,511	95,909
Total	Normal	20,661	96,850	121,812	67,553	28,377	335,253	217,742
	Nonstandard	671	20,854	24,466	8,981	710	55,682	
	Inoperable	340	12,439	3,335	1,379	87	17,580	
	Total	21,672	130,143	149,613	77,913	29,174	408,515	217,742

[a] Because of relatively low number of sample points, reliability of area estimates may be low, especially for specific volume classes

[b] Ownership coding is as of 1985

[c] Volume class bounds are Scribner scale with the exception of 8 MBF/acre, which is International 1/4-inch scale.

[d] Economically operable area includes only area of "normal" Operability in volume classes greater than 20 MBF/acre

Source Data extracted at the request of the author from USDA Forest Service TLMP1 data base by USDA Forest Service, Alaska Region Area estimates are based on approximately 5,100 points from the TLMP1 data base, which was constructed in the late 1970s by coding volume per acre and Operability estimates from interpretations of aerial photograph points

A more conservative definition of "economic Operability" would have resulted in a significantly lower estimate of economic timber volume. For instance, if it were assumed that one-third of the volume in the 20-30 MBF per acre volume class with normal Operability was not economically operable, this would reduce the estimate of economic volume would be reduced by nearly 1 billion board feet, to 5.7 billion board feet.[16]

My estimate of economic volume is based in part on the Forest Service definition of "normal" Operability, which reflects Forest Service Operability and usage standards as of the late 1970s. I do not know whether these standards overstate or understate Operability and usage for Native corporations. Native corporations face less restrictive and expensive standards in harvesting and marketing timber than does the Forest Service. Unlike timber harvested from public lands, Native corporation timber harvests may be exported as round logs. Native corporations also face less stringent

[16] Harvest data for 29 harvested areas on public lands and 28 harvested areas on private lands were gathered in a 1987 study of harvest residues in southeast Alaska Harvest volume per acre ranged between 13 and 70 MBF on public lands and between 21 and 49 MBF on private lands (Howard and Setzer 1988 43)

Table 6—Estimated timber volume on forest land conveyed to southeast Alaska Native corporations, by volume class and Operability[a]

Owner	Operability	Volume class (MBF/acre)[c] 0-8	8-20	20-30	30-50	50+	Total volume	economically operable volume
		MMBF						
Village corporations	Normal	73	738	1,614	1.306	832	4.563	3,751
	Nonstandard	3	139	290	197	30	659	
	Inoperable	1	87	30	2	0	120	
	Total	77	964	1,934	1,505	862	5,343	3,751
Sealaska	Normal	51	530	1,273	1,126	519	3,499	2,918
	Nonstandard	1	134	290	126	4	555	
	Inoperable	1	76	49	47	4	177	
	Total	53	741	1,612	1,300	527	4.232	2.918
Total, All Native lands	Normal	124	1,269	2,887	2,432	1,351	8,062	6.670
	Nonstandard	4	273	580	323	34	1,241	
	Inoperable	2	163	79	50	4	298	
	Total	130	1,705	3,546	2,805		9.574	6,670 1,389

[a] Total volume estimates were calculated by multiplying estimated areas shown in table 5 by assumed average volumes per acre for each volume class, regardless of Operability. Assumed average volumes per acre for each volume class were as follows. 0-8 6.0, 8-20. 13.1, 20-30 23.7; 30-50- 36 0; 50+. 47 6 These volume estimates are for bureau scale and are intended to estimate net volume as scaled at delivery, allowing for breakage, losses in delivery, hidden defects, and 32-foot logs Assumed volumes per acre were based on a previous inventory in which photo interpretations were compared with ground measurements of plots "Economically operable" volume estimates were calculated by using the same method but included only areas with "normal" Operability and volume classes greater than 20 MBF/acre Because of relatively low number of sample points, reliability of volumes estimates may be low, especially for specific volume classes

[b] Ownership coding is as of 1985.

[c] Volume class bounds are Scribner scale with the exception of 8 MBF/acre, which is International 1/4-inch scale.

[d] Economically operable area includes only area of "normal" Operability in volume classes greater than 20 MBF/acre

standards for road construction and retention of old growth (to protect multiple-use values) than does the Forest Service. By themselves, these factors might increase the economic timber inventory of Native corporation lands compared with similar timber stands on Forest Service lands.

These factors may be more than offset by the ability of the Forest Service to subsidize timber harvests through road building and other investments. In addition, Forest Service timber-use requirements result in greater volume removals from a given timber stand than Native corporations would achieve, because high-value logs are required to subsidize the harvest of logs that might not "pay their own way out of the woods" on Native lands.[17]

[17] In theory, timber on private lands is harvested only if the marginal profit is positive. On public lands, usage standards may require harvesting some timber having a negative marginal profit, although average profit remains positive.

No estimate of standard error was available for either the TLMP1 area or volume data. Because of the relatively few sample points on which these data are based, it is likely that the estimates are subject to a similar margin of error as the FIA data, especially for specific volume and operability classes. Given the wide margin of error associated with each, the FIA and TLMP1 volume estimates are consistent: the liberal TLMP1 figure of 6.7 billion board feet for economically operable timber volume and the more conservative figure of 5.7 billion board feet both fall within the FIA 66-percent probability range of 4.9 to 6.9 billion board feet.

Other Inventory Estimates

The only other estimates of timber inventory conveyed to Native corporations have been undertaken by or for the corporations themselves. Most of these estimates are not publicly available, although some information on timber inventories and appraisals has been published in Native corporation annual reports. Many of the corporations have substantially revised their estimates of timber inventories and values at conveyance, based on harvest experience. Differences in timber recovery and species mix from that assumed in original inventories have been important factors in these reappraisals.

Probably the most comprehensive inventory of timber holdings on Native lands was undertaken by the firm Mason, Bruce and Girard, Inc., for Sealaska Corporation and 10 of the 12 village corporations. The survey estimated timberland area, timber volume, and timber quality on lands conveyed to these corporations as of July 1, 1981. It was based on both aerial photography and on-the-ground field work. Results of the Mason, Bruce and Girard survey are not available publicly except for summary figures for Sealaska lands (Sealaska Corporation 1982: 8; 1986: 37). According to the survey, of the 194,000 acres of timberland conveyed to Sealaska by July 1,1981, about 75 percent was commercial grade forestland, 11 percent was noncommercial forestland, and 14 percent was nonforestland. Western hemlock represented 56 percent of the net merchantable volume of timber, Sitka spruce *(Picea sitchensis* (Bong.) Carr.) represented 33 percent, and western redcedar *{Thuja plicata* Donn ex D. Don), and Alaska-cedar *{Chamaecyparis nootkatensis* (D. Don) Spach) represented 9 percent and 2 percent, respectively. The survey reported a net merchantable timber volume in operable areas of 2,997 MMBF. This figure is fairly close to the TLMP1 estimate of economic timber volume for Sealaska of 2.9 billion board feet.[19]

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[18] A timber planner with the USDA Forest Service, Alaska Region, suggested that the data in table 6 might well overstate or understate timber volume by as much as 20 percent Personal communication. December 2, 1988, Bill Wilson, Timber Planner, USDA Forest Service, Alaska Region, P 0 Box 21628, Juneau, AK 99802-1628

[19] Sealaska Corporation land area increased by only a few thousand acres between 1981, the year of the Mason. Bruce and Girard survey, and 1985, the year for which the Forest Service estimated Native forest area and inventory USDA Forest Service 1990 Region 10 Native land selections statistics as of July 1, 1990. 16 p Unpublished table On file with. Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508.

The Mason, Bruce and Girard estimate for economic volume on Sealaska Corporation lands being fairly close to the TLMP1 estimate lends increased confidence to the TLMP1 estimate; however, neither estimate allows for the effect of changing market conditions on the volume of timber that could be economically removed.[20]

Summary of Inventory at Conveyance

Only limited data on timber volumes originally conveyed to southeast Alaska Native corporations are available publicly. Estimates based on these data are subject to a wide margin of error. Figure 3 summarizes these estimates. Available data suggest that Native corporations may have originally received about 409,000 acres of timberland with a total standing timber volume of about 10 billion board feet. As little as half of this total timber volume was economic even under the favorable market conditions at the time of conveyance. There is about a two-thirds probability that economic timber volume at the time of conveyance was between 4.9 and 6.9 billion board feet and a 95-percent probability that economic volume was between 4.0 and 7.8 billion board feet.

Native Corporation Timber Harvests to Date

Timber harvests and other removals from inventory have shaped the current inventory situation on Native lands. I will present available data on Native timber harvests and examine markets for Native timber, which were severely depressed from 1981 through 1986 but have subsequently rebounded strongly. I will then discuss why removals from economic inventory may have significantly exceeded reported timber harvests. Finally, I will give low, medium, and high estimates for total removals from economic timber inventory on Native lands to date.

Timber Harvests

There are no formal requirements for reporting of timber harvests by Native corporations or other private landowners in Alaska. Substantial inconsistencies occur in different estimates of Native harvests prepared by several public agencies.

The Forest Service has published various estimates of harvests from Native lands in its annual *Timber Supply and Demand* reports for the Tongass National Forest (Mehrkens 1983. 1984, 1985; Mehrkens and Miller 1987; USDA Forest Service 1982, 1986b, 1988b, 1989,1990). Four of these sets of estimates are shown in table 7.

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[20] A crude estimate of timber volume conveyed to Native village corporations can be arrived at by dividing total initial appraised timber value by an assumed average appraised value per MBF Ten of the twelve village corporations reported initial timber value appraisals (presumably based on 'the Mason, Bruce and Girard survey) These appraisals totaled $742.426,000 Three of these corporations also reported inventory volumes for recoverable timber with average appraised values of $113/MBF, $100/MBF, and $90/MBF Assuming an average appraisal of $100/MBF for all 10 corporations results in an estimated total volume of 7,425 MBF, which is almost twice as high as our TLMP1 estimate for "economically operable" volume on village corporation lands Given the very rough nature of this estimate and the problems Native corporations have reported with their initial appraisals, little confidence can be placed in this figure

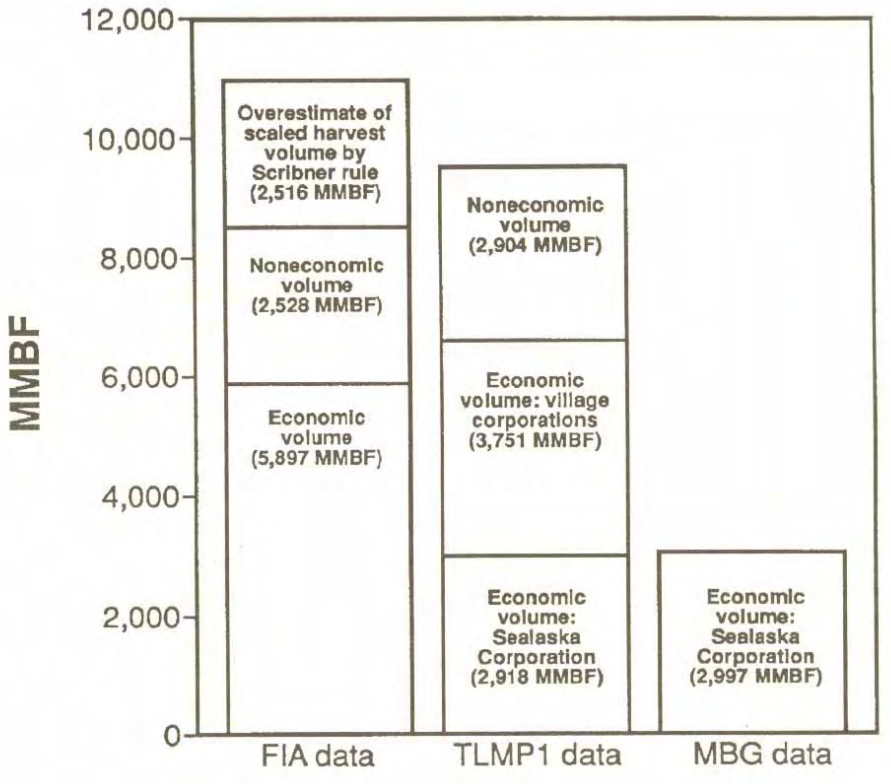

Figure 3—Estimates of original timber volume conveyed to southeast Alaska Native corporations Estimates for left bar based on Forest Inventory and Analysis data, estimates for center bar based on Tongass Land Management Plant (TLMP1) data, and estimates for right bar based on Mason, Bruce and Girard data

Until 1987, the Forest Service published harvest estimates by calendar year. These estimates were derived by contacting Native corporations and asking how much timber they had harvested; however, not all corporations were contacted or were willing to provide this information. A Forest Service economist who helped to prepare these estimates has stated that they were probably reliable within about 10 percent either *way.*[21] In the 1988 report (USDA Forest Service 1988b), a different set of harvest estimates, calculated similarly, was shown by fiscal year.

[21] Personal communication, March 24. 1989, Les Miller, Economist, USDA Forest Service, Alaska Region, Box 21628, Juneau, AK 99802-1628

Table 7—Estimates of timber harvests on southeast Alaska Native corporation lands

Year	Estimates					
	Forest Service 1987 (calendar *year)*[a]	Forest Service 1988 (fiscal year) [b]	Forest Service 1989 (fiscal year)[c]	Forest Service 1990 fiscal year) [d]	Alaska Department of Commerce and Economic Development (calendar year)[e]	Alaska Department of Fish and Game. (calendar year)f
			MMBF			
1979	19[g]	19[g]	19[g]	19[g]		
1980	70[h]	62	145	145		
1981	122	113	67	89		
1982	209	194	159[i]	157[i]		
1983	232	228	292[i]	304[i]		
1984	202	207	258[i]	290[i]		
1985	263	253	272[i]	286[i]		
1986	299	293	296[i]	355[i]	315[j]	369k
1987	335	396	411	336[l]		
1988	385	408	372[l]			
1989				613		
Cumulative totals:						
Through 1986	1416	1368	1508	1645		
Through 1987		1703	1904	2056		
Through 1988			2289	2464		
Through 1989				3077		

[a] Source (except for 1979 and 1980)- Mehrkens and Miller 1987. 5.

[b] Source USDA Forest Service 1988b- 6

[c] Source: USDA Forest Service 1989- 2.

[d] Source- USDA Forest Service 1990-10.

[e] Export logs only Pulp log factor reported to be 25 to 30 percent of export sawlog volume Based on telephone surveys by the Department of Commerce and Economic Development, Division of Business Development 1986 figures are from December 1987 summary report 1987 and 1988 figures are from November 1987 summary report (20 MMBF were subtracted from estimate for all southeast export logs to allow for harvests on other private and public lands).

[f] Based on Alaska Department of Fish and Game. Division of Habitat summaries of Forest Practices Act harvest notification reports ("actual" figures for notification areas from previous years) See text for discussion of methodologies used to estimate timber harvests.

[g] Source' Rogers, George W 1985 The southeast Alaska regional economy and communities' evolution and structure. Prepared for U S Department of Agriculture, Forest Service, Region 10, Juneau, AK. Anchorage Institute of Social and Economic Research, University of Alaska, Anchorage November 83 p On file with Institute of Social and Economic Research. University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508 USDA Forest Service, Region 10 is cited **as** the original source.

[h] Source' Mehrkens 1983 5

[i] May include about 20-40 MMBF harvested from private lands in south-central Alaska.

[j] Source- Forest Products Desk, Division of Business Development, Department of Commerce and Economic Development, State of Alaska. 1987 Alaska export quality sawlog supply information Unpublished table [December] On file with. Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508. Figure includes only harvests of export quality sawlogs Pulp log factor is indicated as 25 to 30 percent of export saw-log volume 15 MMBF was subtracted from export log harvest total to allow for harvests on other private and public lands

[k] Estimate prepared by author based on Alaska Department of Fish and Game, Division of Habitat, summaries of Forest Practices Act harvest notification reports

[l] Source-Alaska Department of Commerce, Division of Business Development 1988 Southeast Alaska forest product exports Unpublished table [November] On file with Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508. Figure includes only exports of logs 20 MMBF was subtracted from export log total to allow for harvests on other private and public lands

In the 1989 report (USDA Forest Service 1989). Native corporation harvests were estimated from Alaska export and import data from the U.S. Department of Commerce. Total southeast and south-central Alaska harvests were estimated from net exports of logs and net exports of other forest products (cants, pulp, and woodchips) that were multiplied by assumed ratios of log use per unit of production. Native corporation harvests were assumed equal to estimated total harvests minus harvests from public lands. This methodology is more rigorous than earlier procedures for estimating Native timber harvests. It is dependent, however, on several assumptions about ratios of final production to log use and the domestic consumption of Alaska wood products. Other problems are that for some years it was not possible to distinguish between Native corporation timber harvests from southeast and south-central Alaska, and the timing of exports may significantly lag the timing of harvests.

In the 1990 report (USDA Forest Service 1990) a similar methodology was used. Estimated pulp log harvests were somewhat higher, however, thereby resulting in higher estimates of total harvests than in the 1989 report.

Despite year-to-year differences, the Forest Service harvest estimates shown in table 7 appear roughly similar for cumulative harvests from Native corporation lands. The higher cumulative figures for the 1989 and 1990 estimates could result in part from the inclusion of some south-central Alaska harvests.

Despite their limitations, these data represent the best available estimates of timber harvests to date by Native corporations in southeast Alaska. They suggest that as much as 3 billion board feet of timber were harvested on Native lands between 1979 and 1989. Except for a slight decline in 1984, the level of timber harvests increased every year to annual levels of about 400 MMBF in 1987 and 1988. In 1989, harvests increased substantially to about 600 MMBF.

A few other estimates of Native corporation timber harvests for recent years are shown in table 7. These are roughly similar to the Forest Service estimates. Estimates by the Alaska Department of Commerce and Economic Development and the Alaska Department of Fish and Game suggest that total harvests (including pulp logs) may have been more than 350 MMBF in 1986 and more than 400 MMBF in 1987 and 1988.[22]

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[22] In 1987 and 1988, the Alaska Department of Commerce and Economic Development (DCED) estimated Native harvests from discussions with some but not all Native corporations. In 1987, DCED estimated total log exports from Native lands at 315 MMBF in 1986 and 335 MMBF in 1987, with a "pulp log factor of 25 to 30% of export sawlog volume." (Source* Forest Products Desk, Division of Business Development, Department of Commerce and Economic Development, State of Alaska. 1987. Alaska export quality sawlog supply information Unpublished table [December] On file with Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508) This would imply total harvests in each year of about 410 MMBF. In 1988, DCED estimated total log exports from southeast Alaska at 356 MMBF in 1987 and 392 MMBF in 1988 (Source: Alaska Department of Commerce, Division of Business Development 1988 Southeast Alaska forest product exports Unpublished table. [November]. On file with' Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508) Assuming 20 MMBF of log exports from other private and public lands results in log exports of 336 MMBF in 1987 and 372 MMBF in 1988. If pulp log harvests are allowed for, then this would imply harvests of well over 400 MMBF in each year. Indirect harvest estimates also have been calculated by the Alaska Department of Fish and Game, Division of Habitat, based on Alaska Forest Practices Act harvest notification reports. Estimated actual harvests for 1986 were 369 MMBF. Estimated proposed harvests for 1987 were 450 MMBF Some Native corporations have reported timber harvests in their annual reports. Because these are available only for some corporations in some years, they do not provide a basis for estimating total Native harvests

Markets for Native Timber

The major products produced on Native lands are hemlock, spruce, and cedar logs. The primary market for these togs is Japan, with some shipments to Korea and to China (Sealaska Corporation 1983:10). Hemlock, spruce, and cedar logs accounted for 51 percent, 37 percent, and 8 percent, respectively, of all log exports from Alaska between 1980 and 1988. most of which were harvested from Native lands (Warren 1989:27).

Unlike timber harvested from the Tongass National Forest. Native timber harvests are not subject to primary processing requirements. Whereas most saw logs harvested from National Forest lands are cut into cants before export, most Native timber is exported as round logs.

Although round log exports are the most important market for Native timber, utility logs (lower grade logs that cannot be exported) form an important component of timber harvest volume. The primary markets for utility logs are the two southeast Alaska pulp mills. Depending on market conditions, utility logs can represent as much as 30 percent or more of the volume of export logs from a given harvest area.

Markets for export logs—Prices for Alaska export logs were at historically high levels in 1980 when large-scale timber harvests were beginning on Native lands. By 1983, with world timber markets in a deep depression, export log prices had fallen sharply. In 1987 and 1988, export log prices rebounded, and by 1989 markets were at or above 1980 levels.

Table 8 and figure 4 show average prices of softwood log exports of spruce and hemlock from Alaska from 1980 through 1989. Average spruce prices declined by almost 15 percent between 1982 and 1984. and average hemlock prices declined by almost 30 percent between 1982 and 1986. These averages may significantly mask, however, the severity of the decline in prices for export logs, because as prices fell, fewer tow-grade togs were exported.

Cape Fox Corporation (1983: 5, 6) reports that average timber prices received by the corporation declined from $750/MBF in 1980 to $375/MBF in 1982. With rising log production costs, the return to the corporation from trees sold dropped 45 percent in only a 2-year span.

Prices for export logs differ widely depending on species and grade. During the fourth quarter of 1988, for example, one Native corporation reported prices as high as $2640/MBF for select spruce logs and as low as $288/MBF for the lowest grade spruce togs, with an average value of $1286/MBF for all spruce logs. High-quality Sitka spruce tends to be more insulated from market cycles and competition, while supplies of lower quality spruce and hemlock fluctuate widely in response to international tog and lumber prices (Mehrkens and Miller 1987:17). Price declines during the mid-1980s were greatest for lower grade hemlock.

Although the general market conditions described above have affected all corporations, specific market conditions have differed widely among corporations as a result of differences in species mix and grade, volumes of timber available for sale, and corporate marketing expertise.

Table 8—Average value of spruce and hemlock log exports from Alaska"

Year	Spruce	Hemlock
	----$/MBF----	
1980	553.26	408.29
1981	578.85	382.17
1982	577.74	424.61
1983	511.54	358.71
1984	496.00	319.97
1985	527.64	310.28
1986	541.12	302.54
1987	587.59	371.37
1988	641.21	411.46
1989[6]	603.85	412.08

[a] Derived from U.S. Department of Commerce export statistics. The valuation definition used in the export statistics is the value at the seaport or border port of exportation.

[b] First 3 quarters only

Source. Warren 1989: 27.

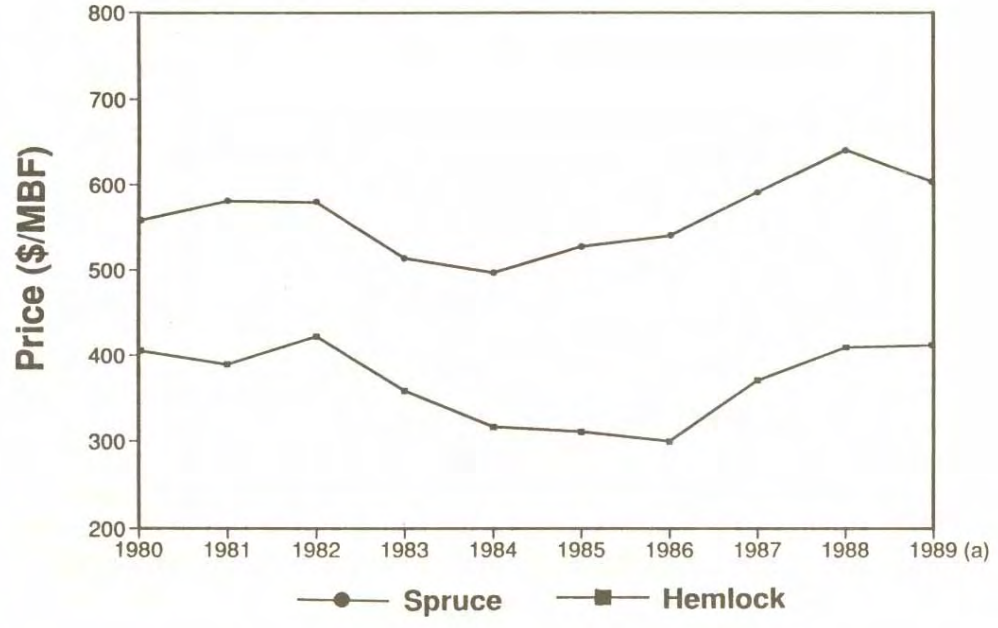

Figure 4—Average value of spruce and hemlock log exports from Alaska. Data for 1989 are for first three quarters

Marketing is complicated by a lack of local markets and by inventories consisting of a mix of highly sought after old-growth timber and significant volumes of defective timber. For most corporations, volumes are too low to sort shipments of different species or grades specifically for customers in different locations overseas. During times of poor markets, corporations may have to significantly discount some grades of logs to sell other more valuable grades that are part of the same shipment. At other times, purchasers may pay more for lower grade timber to have access to higher grade timber.

Utility log markets—Although round log exports are the most important market for Native timber, markets for lower quality utility logs have a significant effect on the profitability of timber harvests.

In 1980, the first year of significant harvests by Native corporations, the two southeast Alaska pulp mills in Sitka and Ketchikan provided a market for utility logs. Beginning in 1981, however, it became increasingly difficult for Native corporations to sell utility logs owing to depressed markets. By 1982, many pulp quality logs on Native land were being left in the woods. In 1983, southeast Alaska pulp mills began to import lower cost logs from British Columbia, which further displaced Alaska's lower quality timber in local pulpwood markets (Mehrkens 1983: 4,1984:5; USDA Forest Service 1986b: 31).

In contrast to the market for high-quality timber, in which the Native corporations had an advantage because of their exemption from primary processing requirements, Native corporations could not compete effectively with pulp tog supplies from Federal lands. In 1985. Sealaska Corporation stated (USDA Forest Service l986a: 93) that the Forest Service's practice of offering an average of 450 million board feet of timber each year during periods of depressed timber markets had

> ...compounded the difficulty faced by the Southeast Alaska ANCSA corporations in finding local markets for pulpwood and low-quality saw logs produced from their timberlands...and has had an adverse impact on the ANCSA corporations' efforts to...achieve reasonable prices for timber which does not meet export market standards. Market conditions can and have dramatically affected the utilization standards on these private lands....While private timberland owners have continued to work toward greater utilization of the low-quality timber on their lands, actions taken by the USES in the management of the Tongass National Forest have continually worked to the detriment of these efforts. Actions taken related to waiver of primary manufacturing requirements, salvage sale management, waivers on contract requirements, imports of timber from Canada, high level of timber being put on the market during depressed conditions, and subsidy of operations through the use of the Tongass Timber Supply Fund have virtually assured that purchasers of, Federal timber will have no need to purchase lower-quality timber from private timberland owners to supply manufacturing facilities in Southeast Alaska.

Pulp markets have improved in recent years. The export price of Alaska pulp exports increased by 83 percent between 1986 and 1989 (USDA Forest Service 1990:19). Reflecting the improvement in markets, operating rates at the two pulp mills increased from 55 percent in 1985 to 70 percent in 1986, 75 percent in 1987, and full capacity in 1988 and 1989 (USDA Forest Service 1988b: 3. 1989:18, 1990: 21). With this improvement in markets, pulp log sales by Native corporations have increased, both to the two Alaska pulp mills and to mills in British Columbia (USDA Forest Service 1990:16).

Table 9 shows Forest Service estimates of Native corporation harvests of export logs and pulp logs. These figures suggest that about 73 percent of total Native timber harvest volume has been sold as export logs, and the remaining 27 percent has been sold as pulp logs. Pulp log sales declined relative to total sales during the depressed market of the mid-1980s.[23]

Other information on the share of pulp logs in total harvests is limited. The Forest Service reports (USDA Forest Service 1982: 56) that "32.3 MMBF of Native timber was sold locally as pulp material in 1980."[24] This would represent about 46 percent of total harvests in 1980. Sealaska Timber Corporation reportedly sold about 20 to 35 percent of its initial harvests to pulp mills (Whitly 1982:12). Pulp logs represented 20 percent of Kake Tribal Corporation's timber harvest in 1981 (25 percent of saw-log harvests) and 22 percent of total harvests in 1985 (28 percent of saw-log harvests) (Kake Tribal Corporation 1983: 7, 1985: 3).[25]

Harvest Costs

Timber harvest costs are high in southeast Alaska. As a result, the profitability of timber harvesting and the economic timber inventory on Native lands was highly sensitive to widely changing market conditions during the 1980s.

Major costs include road construction, log dump construction, camp construction, logging, log truck haul, dumping, and rafting. For any given market conditions, the profitability of harvesting depends on several factors, which may differ greatly among various harvest areas; the factors include the volume, species, and grades of timber to be harvested; the period over which harvests will occur; the length of roads to be constructed and the terrain where road construction and harvests will take place; the existence of log transfer facilities and camps; and the experience and skill of road construction and logging crews. Because Native corporations compete with other landowners for contractors, harvest costs for Native lands are sensitive to the total level of logging activity in southeast Alaska.

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[23] Year-to-year estimates of pulp harvests may not be reliable because the harvest estimates are based on export data and the timing of pulp exports may considerably lag timber harvests

[24] This figure is considerably less than the estimate of 62 MMBF reported in table 8, which suggests that at least one of the figures is incorrect.

[25] In studies done for the Tongass Land Management Plan, the Forest Service assumed that low-quality timber from Native ownerships would be made available to local pulp producers at an average rate of 14 percent of total spruce volume (16 percent of saw-log volume) and 30 percent **of** total hemlock volume (42 percent of saw-log volume) Overall, utility logs would constitute 24 percent of total volume (32 percent of saw-log volume), based on an assumption that spruce harvests would represent 29 percent of total volume (USDA Forest Service 1982 88).

Table 9—Forest Service estimates of harvests of export saw logs and pulp logs from southeast Alaska Native corporation lands

Fiscal year	Export saw logs	Pulp logs	Total	Export saw logs	Pulp logs
	------ *MMBF*------			*---percent---*	
1980[a]	83	62	145	57	43
1981	32	58	89	35	65
1982[b]	137	20	157	87	13
1983[b]	249	54	304	82	18
1984[b]	202	88	290	70	30
1985[b]	225	61	286	79	21
1986[b]	296	59	355	83	17
1987	286	125	411	70	30
1988	286	121	408	70	30
1989	420	193	613	69	31
Total	2217	840	3057	73	27

[a] Source: USDA Forest Service 1989: 2.

[b] May include about 20-40 MMBF harvested in south-central Alaska.

Source. USDA Forest Service 1990:10.

A 1978 Forest Service study[26] estimated average costs of $162 per thousand board feet of timber processed for round log exports, based on costs reported for National Forest sales. The breakdown of these costs was $48 for permanent road construction, $21 for temporary road construction, $63 for logging, $8 for log truck haul, $6 for dumping and rafting, $5 for milling cost from pond breakdown to free-on-board (FOB) shipping including sales cost, and $11 for transportation of pulp logs to market. These figures reflected the cost of an 8-mile haul. They do not reflect the cost of construction of dumping or rafting facilities. Discussions with industry sources suggest that harvest costs may have been as much as 50 percent higher or more on some Native lands.

Cape Fox Corporation (1980:10; 1981: 8) reports that logging costs represented 56 percent of harvest costs in 1980 and 50 percent of harvest costs in 1981; roads represented 26 percent of harvests costs in 1980 and 35 percent of harvests costs in 1981. Overall, harvest costs were 39 percent of total timber value in 1980 and 44 percent of total timber value in 1981.

[26] Glass, Ronald J 1978. An assessment of the demand-supply situation for southeast Alaska timber. Juneau, AK 54 p. Working report prepared for U.S Department of Agriculture, Forest Service, Alaska Region. On file with: Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508.

Because of high fixed costs, logging operations require a high timber volume to be profitable. According to one industry observer, a corporation needs about a shipload per quarter of export quality logs (about 4 MMBF per quarter or about 15 MMBF per year) to sustain harvesting operations.[27]

Other Removals From Timber Inventory

Estimates of timber harvests from Native lands were presented above. These estimates are for actual log sales by Native corporations. Because of the depressed market conditions during the mid-1980s, the volume of timber effectively removed from the original economic timber inventory conveyed to Native corporations may have considerably exceeded estimated timber harvests. There are two primary reasons for this.

First, during depressed markets, large volumes of lower grade timber were left on the ground because the cost of removing it exceeded its market value. The Southeast Alaska Conservation Council claimed in 1985 that "Native corporations have exported a small amount of pulp logs and have left in the woods as much as 20 percent of the timber volume in their harvest areas" (USDA Forest Service 1986a: 93).

A 1988 study (Howard and Setzer 1988) of logging residue in southeast Alaska estimated residue volumes on public and private lands harvested in 1984 and 1985. For 29 publicly owned units, the net volume of chipable wood residue was estimated at 79 cubic feet per thousand board feet of timber harvested. In comparison, for 28 privately owned units, the study estimated the net volume of chipable wood residue at 109 cubic feet per thousand board feet of timber harvested (Howard and Setzer 1988: 20). In other words, the net volume of residue on private lands was 30 cubic feet per thousand board feet harvested higher than on public lands. If a ratio of 4 board feet per cubic foot is assumed, it implies that residues on private lands exceeded residues on public lands by 120 board feet per thousand board feet harvested. Put differently, harvesting the private lands according to the same use standards as the private lands would have increased the total harvest on private lands by more than 10 percent. Given economic inventory estimates based on Forest Service use standards, removals from Native economic inventory during this period would have been 10 percent greater than reported total harvests.

The second reason is that in areas harvested during depressed timber markets, marginal timber in lower volume stands or at the edges of harvest areas may have been left standing that would have been removed had prices been higher. Much of this timber left on the stump may no longer be economically accessible, because of the high fixed set-up costs of new logging operations and the high volumes needed to support a new timber harvesting operation.

Without better data, it is impossible to know exactly how much timber volume has been removed from economic inventory because it was left on the ground or on the stump on Native lands harvested during depressed markets. It seems reasonable to assume, however, that this volume may have been as great as 20 percent of total harvests from 1983 to 1986.

[27]Personal communication, March 23, 1989, Frank A Seymour, Marketing Specialist, Division of Business Development, Alaska Department of Commerce and Economic Development, P.O. Box D, Juneau, AK 99811.

Total Removals From Timber Inventory

Available data on timber harvests and volumes of timber left on the ground or on the stump in harvested areas are insufficient to determine exactly how much timber has been effectively removed from the economic inventory originally conveyed to Native corporations. A reasonable range for the volume of total removals from inventory can be determined instead.

Table 10 shows three different estimates of total removals from inventory. The low estimate is based on the lowest timber harvest estimates published by the Forest Service and on an assumption that other removals were 10 percent of harvests between 1983 and 1986. The high estimate is based on the highest timber harvest estimates published by the Forest Service and on an assumption that other removals were 20 percent of harvests between 1983 and 1986. The medium estimate is based on intermediate assumptions for harvests and other removals. These estimates suggest that a reasonable range for total removals from Native economic inventory from 1979 to 1989 is between 2800 and 3300 MMBF.

Factors Affecting Native Corporation Harvests

Table 11 compares estimates of harvests on village corporation lands with harvests on Sealaska Corporation lands.[28] Although Sealaska received about 44 percent of the timber inventory conveyed to Native corporations, harvests from Sealaska lands accounted for only 21 percent of Native harvests through 1989. Thus the village corporations have harvested their timber at a much faster rate than has Sealaska.

The timing of harvests also has differed between village corporation and Sealaska lands. Village corporation harvests increased dramatically from 1982 to 1986 while timber markets were depressed. In contrast, Sealaska harvests stayed near or below 1981 levels during this period and increased sharply when timber markets improved in 1987.

Village Corporation Harvests

Southeast Alaska village corporations have had a wide range of experiences with timber harvests: several village corporations have made large profits from timber harvests, and one was the first Alaska Native corporation to declare bankruptcy. As a result, there are significant exceptions to almost any generalization that might be made about village corporations. There are several reasons for the differences in experience among village corporations: the volume and quality of timber resources conveyed differed significantly among corporations; conveyances and timber harvests were significantly delayed for some corporations as a result of legal disputes, which were resolved in some cases by land trades; and management objectives and expertise also have differed widely among corporations, as have experiences with subcontractors and partners.

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[28] Estimated village corporation harvests were calculated by subtracting reported Sealaska harvests from estimated total harvests As reported above, there are considerable differences in available estimates of total harvests. As a result, estimated village corporation harvests are less reliable than reported Sealaska harvests, which are based on figures provided in corporate annual reports

Table 10—Low, medium, and high estimates of removals of timber from economic Inventory on southeast Alaska Native corporation lands through 1989

Removals	Estimates[a]		
	Low[b]	Medium[c]	High[d]
	MMBF		
Harvests:			
1979	19	19	19
1980	62	145	145
1981	113	67	89
1982	194	159	157
1983	228	292	304
1984	207	258	290
1985	253	272	286
1986	293	296	355
1987	335	396	411
1988	385	385	408
1989	613	613	613
Total	2701	2902	3077
Other removals	98	224	247
All removals	2799	3126	3324

[a] All harvest estimates are based on data presented in table 7 All estimates assume Forest Service 1990 estimates for 1989 harvests

[b] Assumes Forest Service 1988 estimates for 1979-87 harvests and Forest Service 1989 estimates for 1988 harvests Assumes other removals were 10 percent of harvests during the period 1983-86

[c] Assumes Forest Service 1989 estimates for harvests Assumes other removals were 20 percent of harvests during the period 1983-86

[d] Assumes Forest Service 1990 estimates Assumes other removals were 20 percent of harvests during the period 1983-86

Table 11—Estimated timber harvests from Sealaska and village corporation lands through 1989

Calendar year	Harvests		
	Sealaska Corporation	Village corporations[a]	Total[b]
1979		19	19[c]
1980	16[d]	55	70[e]
1981	*45*[f]	77	122[g]
1982	55[f]	155	*209*[g]
1983	25[f]	207	*232*[g]
1984	*22*[h]	180	*202*[g]
1985	50[i]	214	*2Q3*[g]
1986	56[i]	243	299[g]
1987	101[i]	234	411[j]
1988	110[k]	298	408[j].
1989	80[k]	533	613[j]
Total	60[l]	2,243	2.848

[a] Calculated by subtracting estimated Sealaska harvests from estimated total harvests.

[6] Figure for each year is best available estimate of calendar year harvests

[c] Source: Rogers, George W. 1985. The southeast Alaska regional economy and communities: evolution and structure Prepared for U S. Department of Agriculture, Forest Service, Region 10, Juneau, AK. Anchorage Institute of Social and Economic Research. University of Alaska, Anchorage. November 83 p. On file with: Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508 USDA Forest Service, Region 10 is cited as the original source.

[d] Source- Sealaska Corporation 1980- 8. Assumes that 1/2 of reported Sealaska Timber Corporation harvest was from Sealaska Corporation lands.

[e] Source: Mehrkens 1983: 5

[f] Source: Sealaska Corporation 1984: 9.

[9] Source: Mehrkens and Miller 1987: 5

[h] Source: Sealaska Corporation 1986: 37. Figure is for year beginning April 1

[i] Source: Sealaska Corporation 1987:36. Figure is for year beginning April 1.

[j] Source: USDA Forest Service 1990: 10. Figures are for fiscal year ending September 30.

[k] Source: Sealaska Corporation 1990- 24. Figure is for year beginning April 1

[l] Source' Sealaska Corporation 1990: 24. Figure is for total harvests from Sealaska ANCSA lands through March 31, 1990 This is 45 MMBF higher than the total of harvests reported in the table (560 MMBF).

There are, nevertheless, important similarities in the experience of many of the village corporations. Most received conveyance to their lands in 1979. As new corporations, none of the southeast Alaska Native corporations had experience in managing or harvesting timber. Most village corporations entered into agreements with other companies to inventory, manage, and harvest their timber for them. These companies initially included Sealaska Timber Corporation, Koncor Forest Products Company, and ITT Rayonier. Inc. Later some village corporations entered into timber harvest and management agreements with other corporations or managed their timber operations themselves.[29]

The primary if not overwhelming factor in the timber harvest strategies of most village corporations was a need for cash. After years of waiting for conveyance to timber lands, many village corporations faced severe cash flow problems because of factors such as litigation fees, unprofitable investments, and shareholder demand for dividends.

Cape Fox Corporation began to harvest timber in 1979 and other village corporations began harvesting in 1980. These initial harvests were relatively small but most were profitable. Timber prices were high, and many Native corporations saw timber harvests as an opportunity to transform valuable but unproductive timber assets into cash. Several corporations made substantial timber harvesting investments and borrowed money by using their timber as collateral. As a result, when timber prices declined sharply after 1980, many corporations had to continue harvesting or even increase harvests to meet debt payments. This supply response was described in several August 1985 articles in the *Anchorage Daily News* (Bemton 1985a, 1985b, 1985C):

> "We thought we were at the top of a mountain," says Byron Mallott, president of Sealaska, recalling the optimism of five years ago. "In fact, we were at the edge of a cliff and we all walked off together." The value of export quality togs has dropped to less than half its 1980 level. Lower grade pulp logs, which often make up more than half the yield from an acre of forest, are not worth hauling off the hillsides. Several corporations have simply left pulp logs to rot on the ground.

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[29] Sealaska Timber Corporation (STC) was formed early in 1980 to develop and market the forest resources of Sealaska and other Native corporations. By 1981, seven village corporations, including Goldbelt, Shaan-Seet, Klawock-Heenya, Huna Totem, Klukwan, Haida, and Kake Tribal Corporations, had assigned to STC timber totaling more than 620 MMBF Kavilco and later Kake sold timber harvest rights to ITT Rayonier, Inc. Yak-Tat-Kwaan entered into a management agreement with Koncor Forest Products Company, and Shee-Atika recently sold all its remaining timber to a joint venture with Koncor. Koncor, which is owned by several south-central Alaska Native corporations, was described in 1983 as "an organization which collectively manages commercial forest lands for participating landowners. Basically the Koncor program is a partnership venture where timber harvesting rights are given in return for revenues derived from the harvest of all lands managed in the program. This purportedly provides a more even flow of revenues to all participants" (Mehrkens 1985: 3) Goldbelt, Cape Fox, and Kootznoowoo have sold most of their remaining timber to Klukwan, Inc. or ITT Rayonier.

> Despite the poor market, logging will continue. Many of the corporations are deeply in debt and can't afford to stop. Since 1980, six village corporations have borrowed more than $30 million to help finance roads, ports, heavy equipment and crew payrolls, according to corporate annual reports....Two banks now hold more than 60,000 acres of Native lands as collateral for loans....
>
> Back in 1980, it was thought that timber investments would begin to pay off in a few years, providing the cash for dividends promised to shareholders. Now the loans are coming due. For many of the corporations, the only way to pay the bills is to log....

Adding to the difficulties caused by declining timber markets were overly optimistic expectations about merchantable timber inventory. For many corporations, initial long-term planning and financial commitments for timber harvests were based on inaccurate inventory assessments.[30]

Net operating loss sales—The substantial timber harvesting losses from 1981 to 1985 ironically became the basis for significant revenues to several village corporations in subsequent years through the sale of net operating losses. As a result of a provision of the 1986 Tax Reform Act, Alaska Native corporations were permitted to sell net operating losses (NOLs) until 1991. Each dollar of loss purchased by a profitable corporation could be used to reduce its taxes by 34 to 46 cents. Up to 80 percent of the tax savings were returned to the Native corporations in payment for the NOLs (Bernton 1987b). In effect, every dollar of loss could be worth between 24 and 36 cents to a Native corporation.

In 1986 and 1987, four southeast Alaska Native corporations together reported more than $600 million in losses from logging operations and stumpage sales (Bernton 1987b). These included both "hard" losses on logging operations and "soft" losses or timber depletion losses due to decline in timber values from the time of conveyance.[31] Many of the corporations undertook new appraisals, which concluded that timber values at conveyance had been significantly undervalued in the original appraisals, thus increasing the magnitude of the soft losses.

As a result of the NOL sale provisions, southeast Alaska Native village corporations sold a substantial share of their stumpage, primarily to Sealaska Timber Corporation, Koncor Forest Products Company, and Klukwan, Inc. These companies are now major owners of the remaining timber inventory on village lands in southeast Alaska.

Although it is clear that NOL sales economically benefited Native timber owners, it is less clear what effect they may have had on the rate of timber harvest. If NOL sales had been limited to only hard losses on actual harvest operations, any effects on the rate of harvest would likely have been small. Corporations would have had little incentive to increase hard losses in return for only part of the value of the losses through NOL sales.

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[30] Personal communication, March 23, 1989, Frank A Seymour, Marketing Specialist, Division of Business Development, Alaska Department of Commerce and Economic Development, P 0 Box D, Juneau, AK 99811

[31] The term "hard loss" was used coloquially in the industry and the press to refer to losses incurred on logging operations, when costs exceeded the value of harvests The term "soft loss" was used to refer to a decline in the appraised value of standing timber

The opportunity to sell soft losses may have had a more significant effect on the rate of timber harvests, especially in light of the anticipated end of NOL sale provisions by Congress.[32] Soft losses, based on the difference between timber prices at conveyance and timber prices at the time of sale, could be realized only by actually harvesting timber or by selling stumpage in a lump-sum sale without any retained interest or control over the timber. Corporations that did not sell their stumpage may have accelerated timber harvests or harvested otherwise unprofitable timber to gain a soft NOL. Corporations that made lump-sum purchases of stumpage may have faced pressure to harvest to realize a return on their timber investments. Thus NOL sale provisions may have led to some acceleration of harvesting above rates that otherwise would have occurred in 1986 and 1987.

Acceleration of harvests due to NOL sale provisions would have been limited by several factors. The incentives for accelerating harvest would have declined as timber prices rose to levels they held when the timber was conveyed and as Federal tax rates declined. In addition, in the absence of NOL sales, some cash-starved corporations might have continued to respond to lower prices by increasing timber harvests, as occurred in 1984 and 1985.

In any case, because of the opportunity to sell NOLs. the rapid harvests by many village corporations eventually proved a profitable strategy. According to Robert Loescher, Sealaska senior vice president for resources (Sealaska Shareholder 1988),

> ...some village corporations have exhausted their timber supply and are now being criticized for doing so. If those corporations had not harvested their timber, they would not have had the timber depletion losses that made up the vast majority of Net Operating Loss agreements. I believe that the decision to harvest their lands will turn out to be one of the best business moves those corporations ever made.

Nonsustained yield—No village corporation has attempted to follow a sustained yield approach in its timber harvesting. Most village corporations will have harvested all their merchantable timber within 10 years from when they began harvests, about one-eighth of the time needed to produce marketable volumes of timber on second-growth stands in southeast Alaska.

Not following a sustained yield timber harvest strategy should not be considered irresponsible management by Native corporations. There are good economic reasons for village corporations, in particular, to harvest their timber much more rapidly. A 1978 report summarized the economic situation facing Native corporations in managing their timber as follows:[33]

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[32] The Technical and Miscellaneous Revenue Act of 1988, Public Law 100-647. was signed November 10, 1988 This act barred the sale of losses from transactions occurring after December 31. 1988 (Whitney 1988)

[33] Glass, Ronald J 1978 An assessment of the demand-supply situation for southeast Alaska timber Juneau, AK 54 p Working report prepared for USDA Forest Service, Alaska Region On file with Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508

> The fact that the old growth forests of Southeast Alaska yield little or no growth means that the landowners possess capital which is providing no returns, leaving them in a position where it would be economically rational to liquidate their standing timber as soon as possible and reinvest in more lucrative alternatives.... The long-run stability that might be related to the sustained yield of timber products might also be a factor reducing the rate of liquidation, but this possible stability would also be at an apparent sacrifice to overall net returns.... Whether or not a suitable market for pulp logs can be found may [also] have considerable bearing on the level of harvest from privately owned timber lands.

Klukwan, Inc., expressed the rationale for a strategy of rapid harvest as follows (Klukwan. Inc. 1984):

> Timber prices have actually declined over the nearly four years that we have been in operation. Since timber is an asset and all assets should be providing a decent return to the shareholder, it is easy to see why we feel that our timber is not doing its part. We have millions of dollars of timber on the stump and it is actually declining in value with each passing year. Even at an alternative rate of 10 percent (which is easily obtainable for an investment of this size), we are missing out on millions in earnings as those dollars sit on the stump instead of in the bank. For this reason, we are harvesting significant amounts from Long Island each year to turn our timber asset into assets (primarily cash) which can meet both the immediate and long term needs of our shareholders.

Sealaska's senior vice president for resources has stated (Sealaska Shareholder 1988:3) that:

> ...no Native corporation in southeast Alaska has enough acreage to manage on an economical sustained yield basis. In southeast it takes 80 to 100 years for re-growth. Sealaska would have to hold its annual harvest to below 2,500 acres, and village corporations to less than 200 acres annually, in order to maintain a sustained yield timber harvest practice.

Individual village corporations had to cut timber at a much faster rate than is possible under sustained yield management to harvest enough volume to cover the high fixed costs of timber harvesting.

Yet another factor contributing to rapid rates of harvest by village corporations was a desire to create employment for shareholders. Providing jobs for shareholders is an important goal of many of the corporations.

As a result of these factors and political considerations, an attempt was never made to enforce the Section 22(k) provision of ANCSA, under which Native lands were to be "managed under the principle of sustained yield..." for 12 years. Responsibility for interpreting or enforcing this provision never was assigned by ANCSA or in subsequent legislation.

Sealaska Corporation Harvests

Unlike some village and urban corporations, Sealaska was able to reduce its harvest levels when timber prices declined. According to the Sealaska 1984 annual report (Sealaska Corporation 1984: 8, 9):

> ...volumes logged were deliberately curtailed to avoid selling product into a depressed market...The Forest Products Group operated on a scaled-down plan. marketing enough product to meet customers' basic needs but restricting cutting levels in expectation that there will be better price levels in future years.

The Sealaska 1985 annual report provided an overview of management's long-term objectives (Sealaska Corporation 1985:11,12):

> From the beginning, our land selection has been a careful process. Generally, our lands are selected for their timber and mineral potential....Given our location, and the lands available for Sealaska selection, we estimate that 80% of our commercial lands will fall into the timber development category....Most of the timber developments will most likely occur on Prince of Wales Island, where most of Sealaska's current land conveyances are....Looking 20 to 50 years in the future...a future Sealaska Corporation might well be a holding company, managing investments made possible by capital generated by timber production in earlier years on Native and federal lands and from the sale of long-term timber production....Sealaska would certainly be involved in reforestation of our timber lands (which have a regeneration cycle of 60 to 100 years) and planning for continuing future harvest.

A possible further deterrent to acceleration of timber harvests by Sealaska may have been the Section 7(i) revenue sharing provisions of ANCSA, under which Sealaska is required to distribute 70 percent of net timber revenues among Native regional corporations. Presumably this requirement reduces the incentive for Sealaska to harvest large amounts of timber rapidly, as a significant share of the profits would not flow to the stockholders. I was not able in this study to determine how significant this effect may have been.[34]

Future Native Timber Harvests

It is not possible to predict future harvests from Native corporation lands precisely for several reasons. First, and most importantly, future harvests will depend on market conditions. The volume of timber that can profitably be harvested from current inventories will vary depending on many factors, including prices, harvest costs, interest rates, environmental regulations, tax laws, timber revenue sharing requirements, and competition from other suppliers in southeast Alaska, British Columbia, and the Pacific Northwest.[35] Corporate objectives for managing the timber resource also may change, depending on the relative priority placed on short-term cash needs, long-term sustainability of harvest operations, and environmental objectives for corporate lands. Because of these factors, even Native corporation timber managers may not be able to predict future timber harvests from their own lands for more than 1 or 2 years in the future. If prices fall, planned timber harvests may be reduced or canceled; if prices rise, additional harvest areas may be added.

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[34] Sealaska has been involved in a long-standing legal dispute with other regional corporations over the valuation of timber in determining 7(i) revenue-sharing obligations for timber harvests from 1982 to 1985 In January 1989, a Federal judge upheld an arbitrator's ruling requiring Sealaska to pay more that $14 million to the other corporations The potential significance of the 7(i) provision for Sealaska harvests was illustrated by Sealaska's subsequent announcement that it would not harvest timber in 1989 unless a more favorable timber valuation formula could be negotiated (Anchorage Times 1989, Bernton 1989, Pilkington 1989).

[35] According to the Sealaska 1984 annual report (Sealaska Corporation 1984), contributing to the difficulties in estimating timber resource values were "uncertainties relating to federal regulations governing harvesting techniques and export marketing limitations."

An additional source of uncertainty is the extent of future land conveyances to Native corporations, in particular Sealaska Corporation. As noted earlier, Sealaska is entitled to additional lands equivalent to between 12 and 43 percent of its current land holdings. The actual extent of these conveyances will have a significant effect on potential future harvests by Sealaska.

I used two different approaches to examine potential future harvests from Native lands. First. I developed low, medium, and high estimates of current economic inventory by subtracting estimates of harvests and other removals from estimates of original economic inventory conveyed to Native corporations. Second, I summarized available information about remaining inventory and harvest plans for each of the 13 corporations.

Remaining Timber Inventory on Native Lands

Table 12 and figure 5 show three different estimates of remaining economic inventory on Native lands. These estimates were calculated by subtracting estimates of harvests and other removals from estimates of original economic inventory conveyed to Native corporations. The low estimate is based on a low assumption for inventory conveyed and a high assumption for timber removals; the high estimate is based on a high assumption for inventory conveyed and a low assumption for removals. These estimates suggest a range that current Native inventory is likely to lie within. As of 1990, Sealaska's remaining economic inventory is likely to be between 1.4 and 2.4 billion board feet. The remaining economic inventory on village corporation lands is likely to be between 200 million and 1.7 billion board feet.

These estimates suggest that Sealaska could harvest timber at an annual level of 100 million board feet for 14 to 24 years. Harvests from village lands could occur at an annual level of 250 million board feet for 1 to 7 years. Depending on the actual harvest levels, these harvest periods could be shorter or longer.

These estimates of current economic inventory represent broad ranges, but with available data, it is not possible to develop more precise estimates by subtracting removals from inventory conveyed. Given the margin of error associated with available estimates of economic inventory conveyed, it is possible (although less likely) that remaining inventory could be lower or higher than suggested by these ranges.

Projections of Timber Harvests From Native Lands

Industry sources and public officials are broadly familiar with past and present harvest activities on Native lands, inventory conditions, and harvest plans for 1 or 2 years in the future. Some Native corporations also have made statements about their remaining timber inventories and harvest plans. These statements provide another basis for projecting future harvests.

Table 12— Low, medium, and high estimates of original and remaining economic Inventory on southeast Alaska Native corporation lands

Estimate	Ownership	Assumptions: Original economic inventory conveyed[a]	Assumptions: Harvests through 1989[b]	Assumptions: Other removals from inventory[b]	Remaining economic inventory as of 1990	Years remaining at current annual harvest[c]
		MMBF				*Years*
Low estimate	Sealaska Corporation	2154	654	52	1448	14
	Village corporations	2770	2423	195	152	1
	Total	4924	3077	247	1600	
Medium estimate	Sealaska Corporation	2580	616	48	1916	19
	Village corporations	3317	2286	176	855	3
	Total	5897	2902	224	2771	
High estimate	Sealaska Corporation	3005	574	21	2411	24
	Village corporations	3865	2127	77	1660	7
	Total	6870	2701	98	4071	

[a] The medium estimate for total volume was calculated by multiplying the estimated net timber volume of 10,941 MMBF (Scribner), given in table 4, by a scaled harvest volume adjustment factor of 0.77 and an economic operability factor of 0 70 Sealaska's share of this timber volume was assumed to be 43 75 percent based on Sealaska's share of economically operable volume estimated in table 6 Low- and high-estimate inventory assumptions were calculated by subtracting and adding a volume equivalent to the standard error of 16.5 percent to the medium estimate

[b] Based on removals estimates in table 10 Low-estimate figure utilizes high-removals figure from table 10, high-estimate figure uses low-removals figure from table 10 For each estimate, Sealaska's share in harvests and other removals was assumed to be 21 2 percent, based on Sealaska's share in total harvests reported in table 11.

[c] Assumes current annual harvest level of 100 MMBF for Sealaska and 250 MMBF for village corporations

Initial projections of timber harvests from Native lands were limited to estimates of sustainable yield harvest levels. A 1978 report gives a figure of 150 million board feet per year as the maximum potential sustained yield from Native lands:[36]

> In Southeast Alaska alone, private landowners can harvest an estimated 150 million board feet per year on a sustained yield basis. If these timber lands are similar to those that have been harvested in recent years on the National Forest they will yield 114 million board feet of quality logs suitable for export and 36 million board feet of pulp logs....An accelerated harvest from private lands of 225 million board feet per year is apt to have a somewhat greater effect on the Southeast Alaska timber industry.

[36] Glass, Ronald J 1978. An assessment of the demand-supply situation for southeast Alaska timber. Juneau, AK 54 p Working report prepared for USDA Forest Service. Alaska Region On file with. Institute of Social and Economic Research, University of Alaska Anchorage. 3211 Providence Drive, Anchorage, AK 99508. The figure of 150 MMBF was cited as being based on information provided by Sealaska Corporation

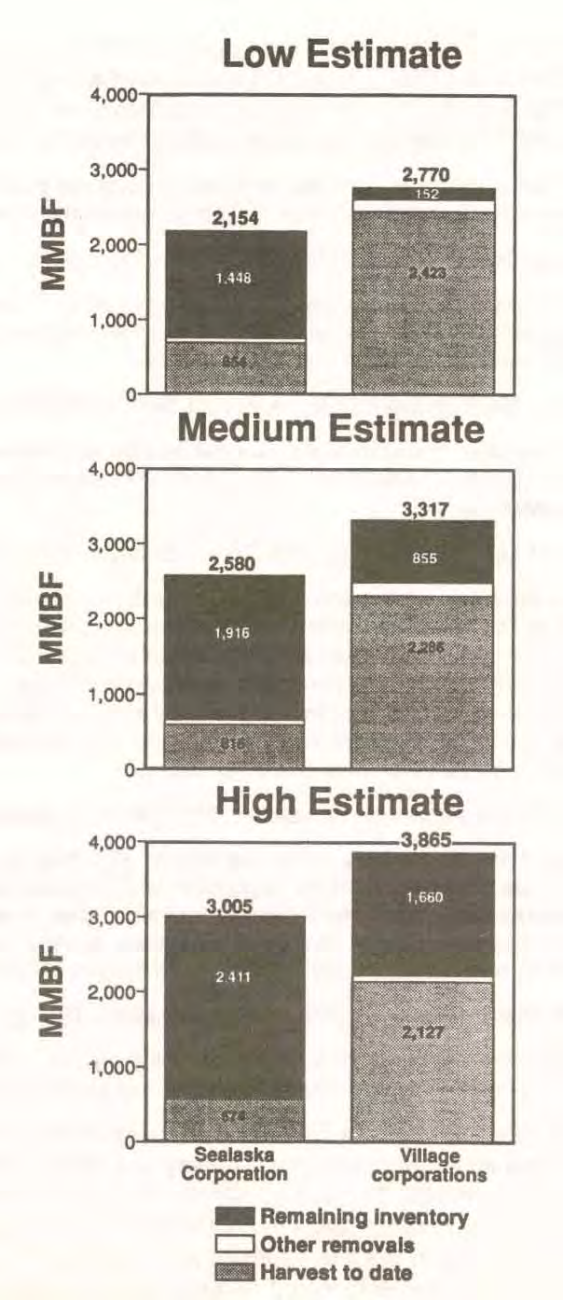

Figure 5—Low. medium, and high estimates of original and remaining economic inventory on southeast Alaska Native corporation lands. The height of the bar represents the estimated original inventory.

For several years, Forest Service reports repeated the estimate of a sustained yield harvest level of 150 MMBF. As total Native harvests began to exceed this level, the Forest Service and other observers began to predict an eventual decline in Native harvests. A 1982 Forest Service report (USDA Forest Service 1982: 87) states:

> The planned accelerated harvests from private lands will eventually lead to a down-fall period until second-growth stands reach commercial maturity at 60-80 years.

A 1983 Forest Service report (Mehrkens 1983: 21) states:

> Current harvest trends and anticipated improving markets indicate that the harvesting of existing old-growth stands could be completed as early as 25 to 30 years with reentry into second growth stands in 60-70 years.

A 1986 Forest Service report (USDA Forest Service 1986b: 16) states:

> Native corporation timber harvests over the next decade are expected to be between 225 and 350 MMBF annually, assuming current timber management practices continue.

A 1988 Forest Service report (USDA Forest Service 1988a: 2) states:

> Based on timber as yet unharvested, private lands are capable of harvest levels in a range up to 350 MMBF per year until the mid to late 1990s. Actual harvest, however, will depend on a number of factors including market demand; corporate marketing strategies and finances; and previous harvest and remaining volume on timberlands of each corporation. Once the finite high quality stands of old growth are harvested, the remaining timber becomes less valuable. Low volume stands will be more expensive to harvest and more difficult to market.

In 1986, an Alaska economic newsletter (Bradner and Bradner 1986) stated:

> Southeast Alaska's raw log exports may drop by 40% over the next five years as quality stands of timber on village corporation lands are depleted, industry observers say. Sealaska Corporation, the regional corporation, should be able to sustain for some time its current rate of about 75 million board feet/year of round logs cut for export on its own lands, but overall, volumes of logging will fall off.

In 1987, the same newsletter (Bradner and Bradner 1987a) stated:

> Log exports from Native lands in Southeast are expected to drop off sharply over the next 2-3 years to around 100 million board feet yearly, state officials say.

In December 1987, the Alaska Department of Commerce and Economic Development conducted an informal telephone survey of Native corporation stumpage owners' projected future harvests. The survey results, shown in table 13, projected that total saw-log exports from private lands in southeast Alaska would decline from more than 300 million board feet in the late 1980s to only about half this level by the mid-1990s. Sealaska's projected harvests would remain roughly constant at about 100 MMBF per year, but Sealaska would become the dominant supplier as harvests ended on most other Native lands.[37]

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[37] Forest Products Desk, Division of Business Development, Department of Commerce and Economic Development, State of Alaska. 1987 Alaska export quality sawlog supply information Unpublished table. [December] On file with Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508. Not all Native corporations participated in this survey and several have criticized it, although it is unclear whether these corporations consider the results to be overly optimistic or pessimistic

Table 13—Alaska Department of Commerce projections for saw-log exports from southeast Alaska[a]

Supplier	Year				
	1986	1987	1988	1989	1995
	MMBF				
Sealaska Timber Corporation:					
Sealaska lands	125	100	100	100	100
Other lands	100	100	80	70	0
Klukwan and Associates	60	90	100	90	0
Koncor and Associates	30	30	40	40	30
Other public and private saw-log suppliers	15	20	15	20	20
Total	330	340	335	320	150

[a] Future supply figures are based on assumptions of normal markets but do not allow for special distressed or damaged timber sales from public land. Pulp log factor is 25 to 30 percent of export saw-log volume. Estimated species mix is 65 percent hemlock, 25 percent Sitka spruce, and 10 percent cedar.

Source: Forest Products Desk, Division of Business Development, Department of Commerce and Economic Development, State of Alaska. 1987. Alaska export quality sawlog supply information Unpublished table. [December]. On file with: Institute of Social and Economic Research, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, AK 99508.

According to a 1988 Alaska Department of Labor review (Rae 1988: 9), "most [industry observers] agree that marketable timber from Native lands will be harvested by the middle 1990s."

According to the former Ketchikan Area Forester of the Division of Forestry, Alaska Department of Natural Resources, many of the village corporations will be done with significant logging by 1991. In contrast, Sealaska, with a much larger timber base, will be able to continue harvesting for a much longer timber period.[35]

The president of Koncor Forest Products Company, owner of stumpage on several village corporation lands in southeast Alaska, was described as expecting a "drastic reduction in timber harvesting on Native lands in Southeast Alaska by 1990" (Tyson 1988).

[38] Personal communication, May 27, 1988, Bill Hanson. Ketchikan Area Forester, Division of Forestry. Alaska Department of Natural Resources, P.O Box 3361, Ketchikan. AK 99901

Projected future timber harvests by seven village corporations for which information is publicly available are summarized below.

Corporation	Summary of outlook for future timber harvests
Goldbelt, Inc.	Most remaining stumpage owned by Klukwan or ITT-Rayonier. Harvests expected to end by 1991 (Goldbelt 1987: v, 1989:10,11).
Huna Totem Corp.	Timber harvests completed in 1987 (Huna Totem Corporation 1988:10).
Kake Tribal Corp.	Most remaining stumpage owned by Sealaska Timber Corporation. Harvests likely to be completed by end of 1991 (Kake Tribal Corporation 1989:24).
Klawock-Heenya Corp.	"Approximately 220 million board feet remaining at the beginning of 1989 which may or may not be economical to harvest depending upon the market" (Klawock Heenya Corporation 1988: 2). "About four years of prime timber harvesting left or about five years of harvesting second grade timber" (Sealaska Shareholder 1989C: 3).
Klukwan, Inc.	All remaining timber to be harvested by 1991 (Sealaska Shareholder 1989b: 3; Stevens 1987:3).
Kootznoowoo, Inc.	Harvesting on currently owned lands likely to end by 1992. Negotiating with USDA Forest Service for a land exchange, which, if successful, could "substantially extend timber supply" (Kootznoowoo, Inc. 1990:4).
Shaan Seet, Inc.	About 3 years of timber harvesting (60 MMBF) remaining as of May 1989 (Sealaska Shareholder 1989a).

According to discussions with industry observers, timber harvests are nearly completed on lands of most of the other five corporations. Harvests are likely to continue beyond 1995 on lands of only one of these corporations.

In 1988, Sealaska's senior vice president for resource management stated (Alaska Loggers Association 1988:3):

> Almost half of the 12 village corporations have exhausted their timber supply. The other six will exhaust their supply in two or three years. Shee-Atika Corp. has about a 10-year supply. Sealaska has about a 10- to 15-year supply.

He also stated (Sealaska Shareholder 1988):

> Under current market conditions Sealaska has 10 to 12 years of harvesting left....If the market turns down, then the amount of timber we can economically harvest will shrink.

Sealaska has emphasized the uncertainty in projecting future harvests (Sealaska Corporation 1987:36):

> Estimates of the remaining volume and value of harvestable standing timber received under ANCSA may vary greatly based upon fluctuations in future log market conditions, and for economic and cultural reasons, it is probable that not all of the lands will be harvested.

Summary of Native Timber Harvest Projections

There is a general consensus among industry observers that Native timber harvests on lands currently owned by village corporations will decline sharply in the 1990s because of declining inventory. At least 9 of the 12 village corporations are likely to have cut nearly all their economically operable timber by 1991 and will have very little future sale volumes from lands that they currently own. Harvests may continue on lands of two other village corporations until 1994. Only one village corporation is likely to be able to sustain harvests at current levels for more than 5 years into the future. Thus a sharp and continuing decline in harvests from current village corporation lands will occur by 1992. Future land trades could provide additional timber volume to two or three village corporations, however, and thus somewhat slow the decline in harvests from village corporation lands.

Sealaska Corporation, in contrast, still has substantial volumes of timber and has stated that harvests can continue at current levels for 10-12 years if current market conditions continue. If timber prices decline, it is likely that Sealaska harvests will be lower, but they might be spread out over a longer period.

A best-guess projection of future harvests if current market conditions continue is that Native harvests will decline sharply, to 150 to 250 million board feet per year, by 1992 as most village corporation harvests end. Harvests then will gradually decline further to 100 to 150 million board feet per year until the late 1990s. After the 1990s, as Sealaska's remaining volume is harvested, harvests will decline to a lower level measured in the tens of millions of board feet.

Market conditions will play an important role in determining future harvest patterns. If prices continue at high levels, short-term harvests from Sealaska and village lands will be higher, and the eventual decline in harvests will occur sooner. Alternatively, if market conditions decline, harvests will drop more sharply in the short term but may continue at a lower level for a longer period.

Projections by industry observers of the outlook for Native timber harvests are consistent with the low or medium estimates of remaining economic inventory on Native lands presented in table 12, which suggest that village corporations could harvest timber at an annual level of 250 million board feet for 1 to 3 years, and Sealaska could harvest timber at an annual level of 100 million board feet for 14 to 19 years. These suggest that original conveyances of economic inventory, harvests to date, and other removals from inventory may have been similar to the assumptions used in developing the low or medium estimates. This would imply that original economic inventory was between 4.9 and 5.9 billion board feet and total harvests to date have been about 2.4 billion board feet.

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The Alaska Native Claims Settlement Act established 13 Native corporations in southeast Alaska. There are 12 "village" corporations and 1 "regional" corporation (Sealaska Corporation). The Native corporations were entitled to select about 540,000 acres of land out of the Tongass National Forest; about 95 percent have been conveyed. This study reviews Native corporation timber resources, harvests to date, and projected future harvest levels.

Publicly available data on the volume of timber conveyed to Native corporations are subject to a wide margin of error. Estimates based on USDA Forest Service data suggest that economic volume at conveyance was between 4.0 and 7.8 billion board feet. About 56 percent of this timber volume was on village corporation lands, with the remainder on Sealaska lands.

Native corporation timber harvests began in 1979 and grew rapidly to about 400 million board feet in 1987 and 1988, despite depressed timber markets from 1981 to 1986. Timber harvests in 1989 were about 600 million board feet. Since 1983, more than half the timber harvests in southeast Alaska have occurred on Native lands. More than 3 billion board feet were harvested by 1989. Most of the timber is exported as round logs, primarily to Japan.

Most of the village corporations will have harvested all their merchantable timber by 1991. If current market conditions continue, Native harvests will decline sharply between 1989 and 1992 as most village corporation harvests end. About 10 to 15 years from now, harvests will again decline after Sealaska Corporation completes logging on most of its lands.

Keywords: Alaska (southeast), Native corporations, timber harvests, timber inventory.

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